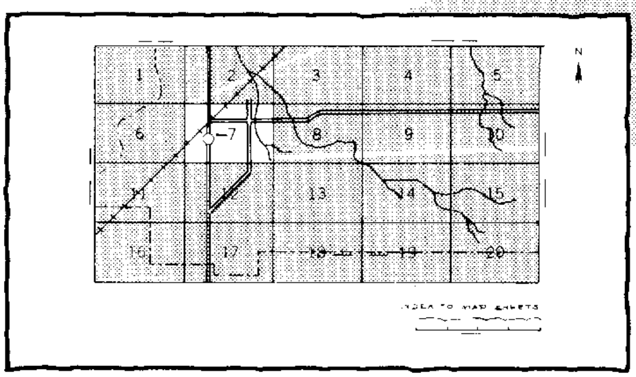
SOIL SURVEY OF

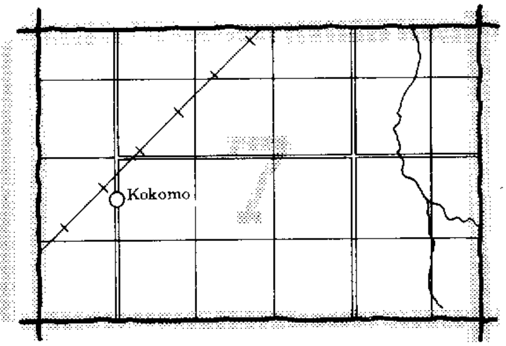
Hempstead County, Arkansas

United States Department of Agriculture
Soil Conservation Service
in cooperation with
Arkansas Agricultural Experiment Station

HOW TO USE

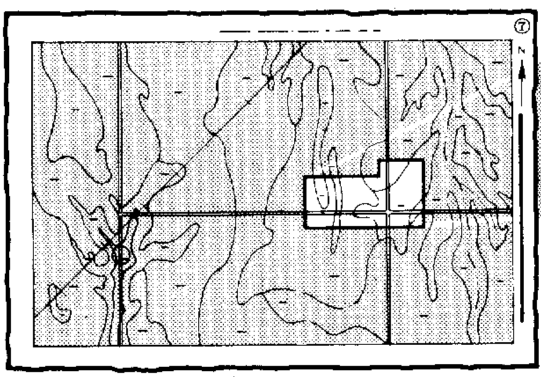
1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

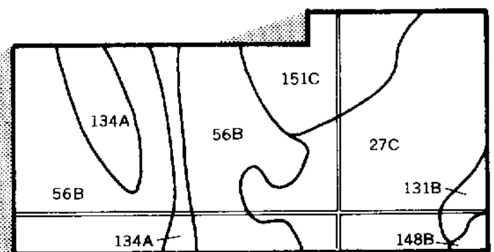




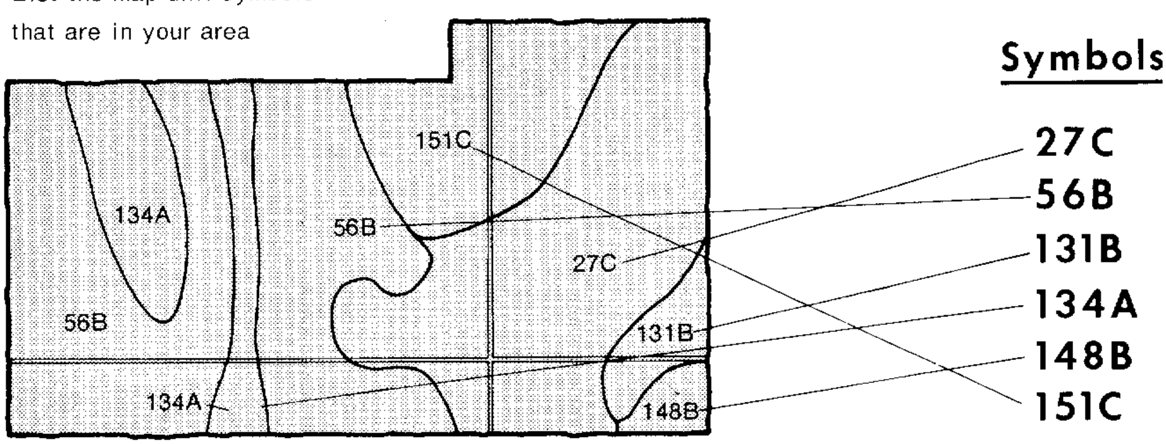
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.



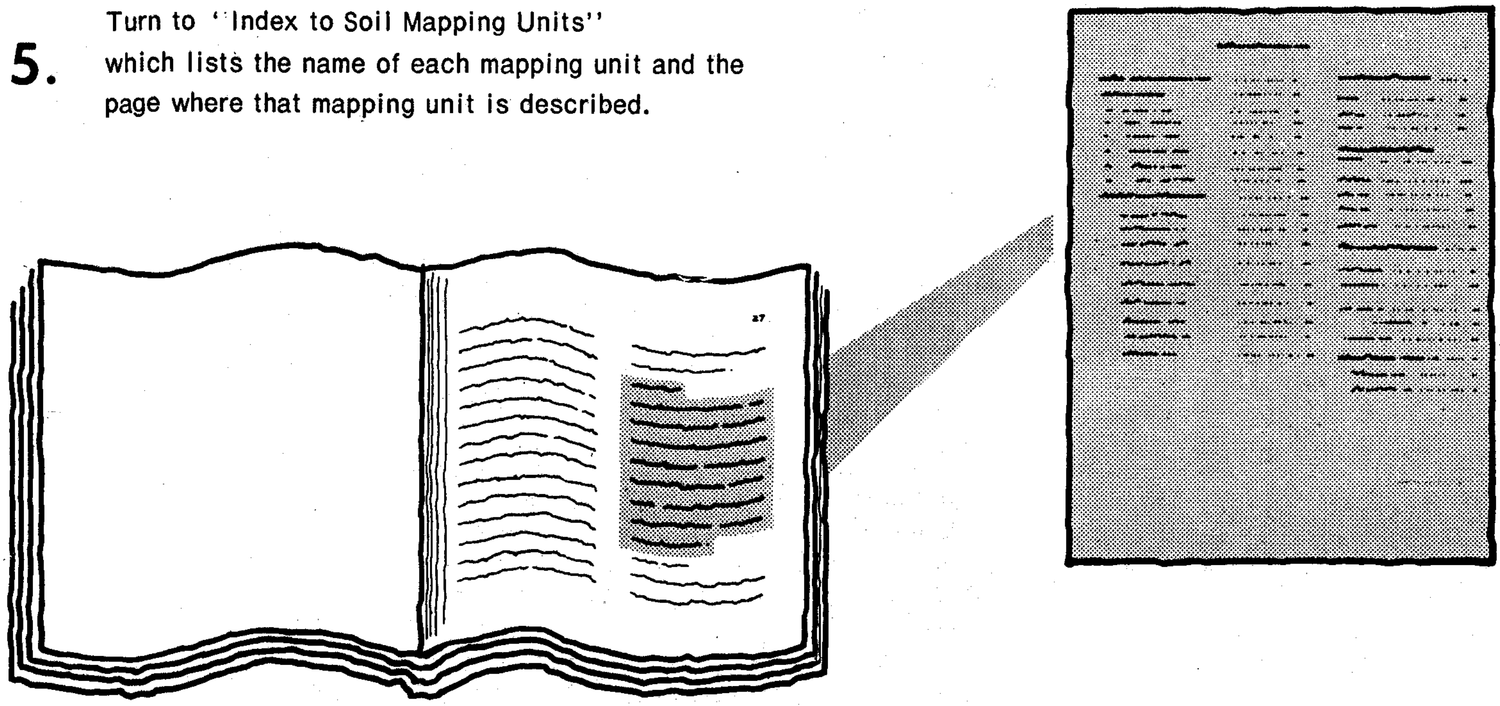


4. List the map unit symbols that are in your area

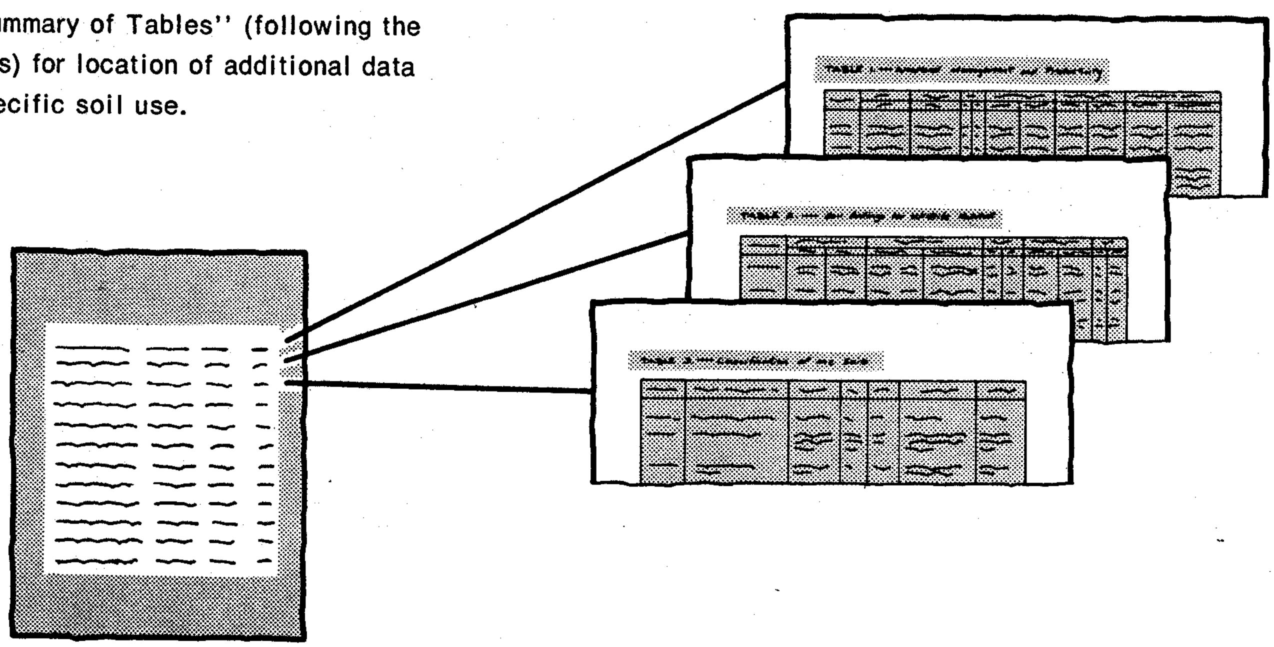


THIS SOIL SURVEY

5. Turn to "Index to Soil Mapping Units" which lists the name of each mapping unit and the page where that mapping unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; for specialists in wildlife management, waste disposal, or pollution control.

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1969-74. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1976. This survey was made cooperatively by the Soil Conservation Service and the Arkansas Agricultural Experiment Station. It is part of the technical assistance furnished to the Hempstead County Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

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Issued January 1979

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Foreword

This soil survey contains much information useful in any land-planning program in Hempstead County. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

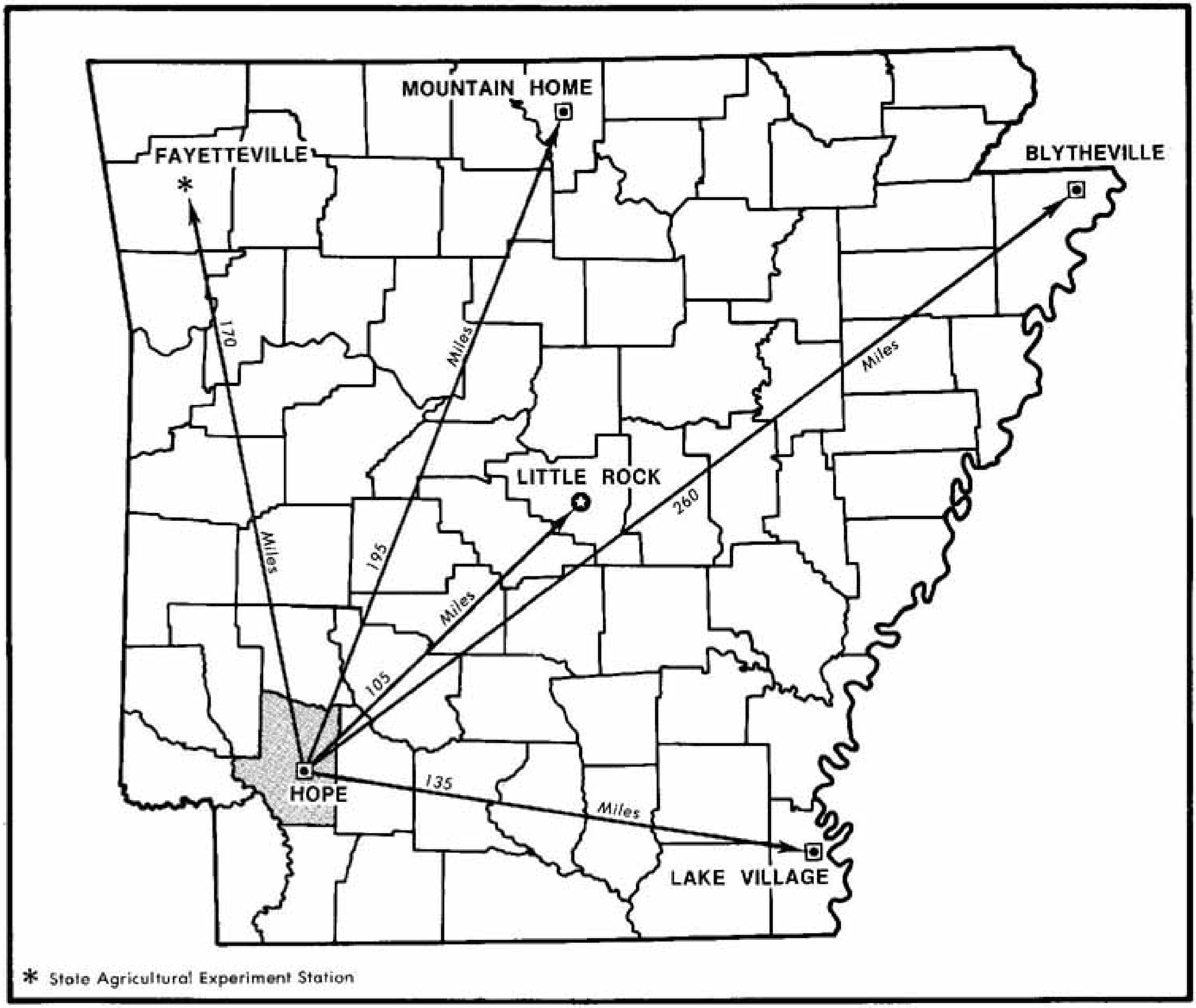
Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.

M J Spears

Maurice J. Spears
State Conservationist
Soil Conservation Service



Location of Hempstead County, Arkansas.

SOIL SURVEY OF HEMPSTEAD COUNTY, ARKANSAS

Soils surveyed by James E. Hoelscher and Glen D. Laurent,
Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service,
in cooperation with Arkansas Agricultural Experiment Station

HEMPSTEAD COUNTY is in the southwestern part of Arkansas. Clockwise from the north, it is bounded by Pike, Nevada, Lafayette, Miller, Little River, and Howard Counties. From Millwood reservoir south to Fulton, the Little River forms the western boundary with Little River County. From Fulton south, the Red River forms the western boundary with Miller County. Because the channel of the Red River is constantly changing, the county boundary line is shown in this publication as an indefinite boundary. The county is irregular in shape. It ranges from about 21 miles wide at the northern boundary, to about 14 miles wide at the southern boundary. The central part of the county is about 30 miles wide. Its maximum length is about 35 miles. According to United States Census reports, the approximate land area is 464,640 acres, or about 726 square miles.

In 1970, the population of the county was 19,308. Hope, the county seat, is the largest town in the county. It has a population of 8,810.

General nature of the county

This section discusses the farming, physiography and drainage, and climate in Hempstead County. Farming statistics are from the 1969 Census of Agriculture.

Farming

The basis of the early economy of Hempstead County was logging and general farming. The main cash crops were vegetables, fruit, cotton, corn, and livestock. In the 1930's reforestation began and now about 60 percent of the county is in woodland that is managed for the production of pulpwood, poles, and sawlogs. Most of the remaining land is used for pasture and forage crops and small acreages are used for watermelons, peach orchards, winter small grain, cotton, and soybeans. According to the 1969 Census of Agriculture, about 46 percent of the county was then in farms. Table 1 shows the acreage of principal crops grown in selected years. Table 2 shows the number and kind of livestock and poultry for selected years.

Between 1964 and 1969, the number of farms decreased from 1,395 to 944 and the acreage in farms decreased from 265,765 to 213,057. The average size of a farm increased from about 190 to 225 acres.

In 1969, 735 farm operators were full owners, 155 were part owners, and 54 were tenants. Of these operators, 449 worked off the farm for 100 or more days. Nearly all the farms are small enough that the operator's family, with occasional outside help in peak seasons, can do the work.

Most farms are mechanized, especially with equipment for livestock and poultry production.

Most of the agricultural products are processed outside the county. The main industrial enterprises that are related to agriculture are lumber mills, feed mills, and broiler hatcheries.

The University of Arkansas operates an experiment station in Hempstead County.

Physiography and drainage

Hempstead County includes parts of three land resource areas, the Bottom land Area in the southwest, the Southern Coastal Plains, and the Blackland Prairies. The soils formed in material from unconsolidated alluvial sediment and from chalk or marl. Except for most soils in the Blackland Prairies and the Bottom land Areas, the soils are predominantly low in plant nutrient content.

The Bottom land Area trends north to south in narrow, level to nearly level flood plains along the Little River and Red River. Natural and artificial drains provide drainage. Ox-bow lakes also characterize this area. All rivers in Hempstead County are county boundaries. No river is completely within the county. The Saline River, Little River, and the Red River form part of the western boundary. Drainage within the county is provided by many perennial and intermittent creeks. Millwood Reservoir inundates the Saline River flood plain and part of the Little River flood plain in the western part of the county.

Tributaries drain south and westerly to the Little River and Red River and carry runoff from the level to gently rolling coastal plains and blackland areas. Some of the main tributaries are Bois D'Arc, Little Bodcaw Creek, and Bodcaw Creek.

In the northern part of the county, tributaries drain north and easterly into Hickory Creek, then into the Little Missouri River. Some of the main tributaries are North Fork Ozan Creek, South Fork Ozan Creek, and Ozan Creek.

The lowest elevation in the county is in its southwestern corner. It may be taken as the pool elevation of Lower Red Lake, 231 feet above sea level. The highest elevation is in the northwestern part of the county, about 500 feet above sea level, at the fire tower near McCaskill.

The supply of surface water in the county is good. The main streams, Little River, Saline River, Red River, and Ozan Creek, flow the year round. Millwood Reservoir retains many thousands of acre-feet of water in its conservation pool. Small, private reservoirs have been built in most parts of the county. Most farms have ponds from one-fourth acre to 15 acres in surface area that furnish water for livestock and recreation.

There is generally a good supply of ground water. Wells in most parts of the county yield an adequate flow for household use.

Special features

One special feature occurring in Hempstead County is an abandoned munitions-impact area that was used during World War II.

This area has about 5 thousand acres. It is characterized by craters varying in depth from 2 feet to about 7 feet and in diameter from about 3 feet to 20 feet or more. These craters occur at random in this area.

Climate

Hempstead County has long, hot summers because moist, tropical air from the Gulf of Mexico constantly covers the area. Winters are cool and short, but a rare cold wave occurs for 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer precipitation, which consists mainly of afternoon thundershowers, is adequate for all crops.

Table 3 gives data on temperature and precipitation for the survey area, as recorded at Hope, Arkansas, for the period 1951 to 1974. Table 4 shows probable dates of the first freeze in fall and the last freeze in spring. Table 5 provides data on the length of the growing season.

In winter the average temperature is 44 degrees F, and the average daily minimum temperature is 32 degrees. The lowest temperature on record, -4 degrees, occurred at Hope on January 12, 1962. In summer the average temperature is 80 degrees, and the average daily maximum temperature is 91 degrees. The highest recorded temperature, 107 degrees, was recorded on August 7, 1956.

Growing degree days, shown in table 3, are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 28 inches or 54 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 20 inches. The heaviest 1-day rainfall during the period of record was 8.52 inches at Hope on August 31, 1974. There are about 53 thunderstorms each year, 19 of which occur in summer.

Average seasonal snowfall is 2 inches. The greatest snow depth at any one time during the period of record was 7 inches. The average relative humidity in midafternoon in spring is less than 55 percent; during the rest of the year it is about 65 percent. Humidity is higher at night in all seasons, and the average at dawn is about 90 percent. The percentage of possible sunshine is 72 percent in summer and 52 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 11 miles per hour, in March.

Severe local storms, including tornadoes, strike occasionally in or near the county. They are short and cause variable and spotty damage. Every few years in summer or autumn, a tropical depression or remnant of a hurricane causes extremely heavy rains for 1 to 3 days.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material, which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the sections "General soil map for broad land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, home buyers, and those seeking recreation.

General soil map for broad land use planning

The general soil map at the back of this publication shows, in color, map units that have a distinct pattern of soils and of relief and drainage. Each map unit is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map provides a broad perspective of the soils and landscapes in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

The soils in the survey area vary widely in their potential for major land uses. The map unit descriptions that follow give the extent of the map units shown on the general soil map and give general ratings of the potential of each, in relation to the other map units, for major land uses. Soil properties that pose limitations to the use are indicated. The ratings of soil potential are based on the assumption that practices in common use in the survey area are being used to overcome soil limitations. These ratings reflect the ease of overcoming the soil limitations and the probability of soil problems persisting after such practices are used.

Each map unit is rated for *cultivated crops*, *pasture crops*, *woodland*, and *urban uses*. Cultivated crops are those grown extensively by farmers in the survey area. Pasture crops include those crops grown for livestock forage production. Woodland refers to land that is producing either trees native to the area or introduced species. Urban uses include residential, commercial, and industrial developments.

Map unit descriptions

The 11 map units in Hempstead County are discussed in the following pages. The terms for texture used in the descriptive heading of the map units apply to the texture of the surface layer.

Areas dominated by nearly level soils on flood plains

This group of map units makes up about 26 percent of the county. The soils are on flood plains of the Red River and near major streams that drain the Blackland Prairies and Coastal Plains. Also included are terrace soils, adjacent to the Red River flood plains, that are not subject to flooding. The soils have a loamy or clayey subsoil and are well drained to poorly drained. They formed in loamy and clayey alluvial deposits.

1. Portland-Desha-Oklared

Deep, level to nearly level, somewhat poorly drained and well drained soils that have a clayey or loamy subsoil; formed in Red River alluvial sediment

These level and nearly level soils are in the southwestern part of the county. They are on flood plains and low terraces of the Red River.

This map unit makes up about 6 percent of the county. About 25 percent of the map unit is Portland soils, 20 percent Desha soils, and 19 percent Oklared soils. The rest consists of minor soils.

Portland and Desha soils are at a slightly lower elevation than Oklared soils. Portland and Desha soils are somewhat poorly drained, and Oklared soils are well drained. Portland and Desha soils have a surface layer of clay and have a seasonally high water table. Oklared soils have a surface layer of very fine sandy loam; they also have a seasonally high water table. Portland and Desha soils are sticky and plastic when wet. Oklared soils are soft and friable when moist.

The minor soils in this map unit are the somewhat poorly drained Latanier soils on low terraces and in abandoned river channels, the poorly drained Perry soils in depressional slack water areas, and the well drained Sterlington soils on low terraces.

Most of this map unit is used as cropland, but some is used for pasture. Most of the acreage has been cleared, and some has been drained. Some swampy areas are not drained. Wetness is the main limitation of these soils for farming. Occasional flooding occurs in winter and spring.

If adequately drained, the soils in this map unit have good potential for cultivated crops and pasture. They have good potential for adapted hardwood forests, but wetness and flooding impose severe equipment limitations. Because wetness and flooding are severe limitations and are difficult to overcome, the potential for residential and other urban uses is poor.

2. McKamie-Gore

Deep, nearly level to moderately sloping, well drained and moderately well drained soils that have a clayey subsoil; formed in Red River alluvial sediment

These nearly level to moderately sloping soils are in the southwestern part of the county. They are on terraces that are parallel to the Red River flood plain.

This map unit makes up about 3 percent of the county. About 63 percent of the map unit is McKamie soils, and 31 percent is Gore soils. The rest consists of soils of minor extent.

McKamie soils are at a higher elevation than Gore soils. McKamie soils are well drained, and Gore soils are moderately well drained. McKamie soils have a surface layer of fine sandy loam or silty clay loam. Gore soils have a surface layer of silt loam and have a seasonally high water table. These soils have a soft and friable surface layer when moist and a sticky and plastic subsoil when wet.

Of minor extent in this map unit is the moderately well drained Sacul soil on rolling uplands in a transitional zone between Red River terraces and the Coastal Plains.

Most of this map unit is used as woodland. Some areas have been cleared and are used for pasture. Wetness is the main limitation to woodland use and management. Wetness in the nearly level areas and the hazard of erosion in the sloping areas are the main limitations of these soils for farming and for most other uses.

This map unit has fair potential for cultivated crops and good potential for pasture and woodland. Because of wetness, slow permeability, and low bearing strength, limitations that are difficult to overcome, the potential for residential and other urban uses is poor.

3. Guyton-Sardis

Deep, level to nearly level, poorly drained and somewhat poorly drained soils that have a loamy subsoil; formed in alluvial sediment

These level to nearly level soils are in the northeastern part of the county on flood plains.

This map unit makes up about 7 percent of the county. About 75 percent of the map unit is Guyton soils and 20 percent is Sardis soils. The rest consists of minor soils.

Guyton soils are on a slightly lower landscape than Sardis soils. Guyton soils are poorly drained, and Sardis soils are somewhat poorly drained. Both soils have a surface layer of silt loam; they have a seasonally high water table. The surface layers of both soils are soft and friable when moist.

Of minor extent in this map unit are the well drained Ouachita soils on natural flood plain levees.

Most of this map unit is used for cultivated crops. Most of the acreage has been cleared, and some has been drained. Some swampy areas are not drained. Wetness is the main limitation of these soils to farming and to most other uses. Flooding and ponding are common in winter and spring.

If adequately drained and protected from flooding, this map unit has good potential for cultivated crops and pasture. Potential for woodland is good. Wetness is a limitation to equipment use, but it can be overcome by using special equipment and harvesting tree crops in dry seasons. Because wetness and flooding are severe limitations that are difficult to overcome, the potential for residential and other urban uses is poor.

4. Una-Tuscumbia

Deep, level, poorly drained soils that have a clayey subsoil; formed in alluvial sediment

These level soils are scattered throughout the county. They are on flood plains draining the Blackland Prairies.

This map unit makes up about 10 percent of the county. About 37 percent of the map unit is Una soils, and 29 percent is Tuscumbia soils. The rest consists of minor soils.

Una and Tuscumbia soils are on a similar landscape. They are poorly drained, have a clayey subsoil, and have a seasonally high water table. They are sticky and plastic when wet.

Of minor extent in this map unit are the somewhat poorly drained Terouge soils and the moderately well drained Marietta soils on a similar landscape.

Most of this map unit is used for cultivated crops, but some is used for pasture. Nearly all of the acreage has been cleared, and some areas have been drained. Some swampy areas are not drained. Wetness is the main limitation of these soils for farming and for most other uses. Occasional flooding and ponding are common in winter and spring.

If adequately drained and protected from flooding, this map unit has good potential for cultivated crops and pasture. It has good potential for woodland. Wetness is the main limitation. Because wetness and flooding are such severe limitations and are so difficult to overcome, the potential for residential and other urban use is poor.

Areas dominated by gently sloping to rolling alkaline soils on uplands

This group of map units makes up about 17 percent of the county. The soils are on the Blackland Prairies and in areas that are transitional to the Coastal Plains. The soils have a loamy or clayey subsoil and are well drained to somewhat poorly drained. They formed predominately in chalk and marl.

5. Oktibbeha-Kipling

Moderately deep and deep, nearly level to rolling, moderately well drained and somewhat poorly drained soils that have a clayey subsoil; formed in marl and chalk

These nearly level to rolling soils are scattered throughout the county. They make up hilltops and hillsides on the Blackland Prairies.

This map unit makes up about 16 percent of the county. About 31 percent of the map unit is Oktibbeha soils and 24 percent is Kipling soils. The rest consists of soils of minor extent.

Oktibbeha soils are on a slightly higher landscape than Kipling soils. Oktibbeha soils are moderately well drained, and Kipling soils are somewhat poorly drained. Oktibbeha soils have a surface layer of silty clay or clay and are sticky and plastic when wet. Kipling soils have a surface layer of loam or silty clay loam; they also have a seasonally high water table. Kipling soils are soft and friable when moist.

Of minor extent in this map unit are the well drained Millwood, Sumter, and Demopolis soils on hilltops and hillsides and the moderately well drained Houston soils, which are on a similar landscape.

Most of this map unit is used mainly for pasture and range, but some nearly level soils are used for cultivated crops. Most of the acreage was originally in native prairie. There are many eroded areas and a few gullied areas. Erosion and depth to chalk are the main limitations of these soils for farming and for most other uses.

This map unit has low potential for cultivated crops and pastures. It has a poor potential for woodland. Because the high shrink-swell potential, the low bearing capacity, and depth to chalk or marl are severe limitations that are so difficult to overcome, the potential for residential and other uses is poor.

6. Oktibbeha-Saffell

Moderately deep and deep, gently sloping to rolling, moderately well drained and well drained soils that have a clayey or loamy subsoil; formed in chalk and gravelly marine sediment

These gently sloping to rolling soils occur in the north-central part of the county. They are on rolling hills of intermingled Blackland Prairies and Coastal Plains.

This map unit makes up about 1 percent of the county. About 60 percent of the map unit is Oktibbeha soils, and 27 percent is Saffell soils. The rest consists of minor soils.

Oktibbeha soils in most places are at a slightly lower elevation than Saffell soils. Oktibbeha soils are moderately well drained, and Saffell soils are well drained. Oktibbeha soils have a surface layer of fine sandy loam, and Saffell soils have a surface layer of gravelly fine sandy loam. They are soft and friable when moist.

Of minor extent in this map unit is the moderately well drained Sacul soil on hilltops and hillsides in the transitional area to the Coastal Plains.

Most of this map unit is used for woodland, but some areas are used for pasture or range. The area has a few escarpments. Steep slopes and the high erosion hazard are the main limitations of these soils for farming.

This map unit has poor potential for cultivated crops and pastures and fair potential for woodland. Steep slopes and areas that have clayey subsoil restrict the use of equipment in the wet seasons. Because of steep slopes and the high shrink-swell potential, this map unit has fair to poor potential for residential and other urban uses.

Areas dominated by gently sloping to rolling acid soils on uplands

This group of map units makes up about 57 percent of the county. The soils are on the Coastal Plains that are scattered throughout the county. These soils have a clayey and loamy subsoil and are well drained to moderately well drained. They formed in loamy and clayey marine sediment.

7. Bowie-Sacul

Deep, nearly level to rolling, moderately well drained soils that have a loamy or clayey subsoil; formed in marine sediment

These gently sloping to rolling soils are in the northwestern part of the county. They are on hilltops and hillsides of the Coastal Plains.

This map unit makes up about 4 percent of the county. About 53 percent of the map unit is Bowie soils, and 12 percent is Sacul soils. The rest consists of soils of minor extent.

Bowie soils are on a less dissected landscape than that of the Sacul soils. Both soils are moderately well drained, have a surface layer of fine sandy loam, and have a seasonal high water table. The surface layer is soft and friable when moist. The subsoil of the Sacul soils is sticky and plastic when wet.

Of minor extent in this map unit are the moderately well drained Sawyer and Savannah soils and the well drained Briley and Smithdale soils, which occur on similar landscapes.

Most of this map unit is used as woodland, but some areas have been cleared and are used for pasture. There are some eroded areas. Slope and the erosion hazard are the main limitations of these soils for farming.

Because of slope, the erosion hazard, and low natural fertility, this map unit has poor potential for cultivated crops. The potential for pasture and woodland is good. Slow permeability, shrink-swell potential, and slopes are moderate limitations that make the potential for residential and other urban uses fair.

8. Briley-Harleston

Deep, gently sloping to rolling, well drained and moderately well drained soils that have a loamy subsoil; formed in marine sediment

These gently sloping to rolling soils are mainly in the northeastern part of the county. They are on hilltops and hillsides of the Coastal Plains.

This map unit makes up about 7 percent of the county. About 50 percent of the map unit is Briley and 27 percent is Harleston soils. The rest consists of soils of minor extent.

Briley soils are on a higher landscape than the Harleston soils. Briley soils are well drained, and Harleston soils are moderately well drained. Both soils have a surface layer of loamy fine sand; the Harleston soils have a seasonally high water table. The surface layer is soft and friable when moist.

Of minor extent in this map unit are the moderately well drained Ora, the well drained Ruston, and the somewhat excessively drained Alaga soils, all of which are on hilltops and hillsides, and the poorly drained Smithton soils in upland depressions.

This map unit is used mainly for pasture, but some areas are used for cultivated crops. Most of the acreage has been cleared. Erosion and droughtiness are the main limitations of these soils for farming.

This map unit has good potential for cultivated specialty crops, fair potential for pasture, poor potential for woodland, and good potential for residential and other urban uses.

9. Sacul-Savannah

Deep, nearly level to rolling, moderately well drained soils that have a clayey or loamy subsoil; formed in marine sediment

These gently sloping to rolling soils are scattered throughout the county. They are on hilltops and hillsides of the Coastal Plains.

This map unit makes up about 32 percent of the county. About 42 percent of the map unit is Sacul soils, and 14 percent is Savannah soils. The rest consists of soils of minor extent.

Sacul soils are on a more dissected landscape than the Savannah soils. Both soils are moderately well drained, have a fine sandy loam surface layer, and have a seasonally high water table. They have a surface layer that is soft and friable when moist.

Of minor extent in this map unit are the well drained Smithdale and Kirvin soils and the moderately well drained Bowie and Ora soils on hilltops and hillsides, and the poorly drained Smithton soils in upland depressions.

Most of this map unit is used as woodland, but some areas have been cleared and are used for cultivated crops and pasture. There are some eroded areas and some escarpments. Erosion is the main limitation of these soils for farming.

Because of the erosion hazard, this map unit has poor potential for cultivated crops, but it has good potential for pasture. This map unit has good potential for woodland and fair potential for residential and other urban uses.

10. Saffell-Sacul

Deep, gently sloping to rolling, well drained and moderately well drained soils that have a loamy or clayey subsoil; formed in marine sediment

These gently sloping to rolling soils are in the northwestern portion of the county. They are on hilltops and hillsides of the Coastal Plains.

This map unit occupies about 3 percent of the county. About 59 percent of the map unit is Saffell soils, and 18 percent is Sacul soils. The rest consists of soils of minor extent.

Saffell soils are on a slightly higher landscape than Sacul soils. Saffell soils are well drained, and Sacul soils are moderately well drained. Both soils have a surface layer of fine sandy loam, and the Sacul soils have a high seasonal water table. The surface layers for both soils are soft and friable when moist.

Of minor extent in this map unit are the moderately well drained Bowie and Savannah soils and the well drained Smithdale soils on similar landscapes.

Most of this soil is used for pasture, but some areas are used as woodland. Most of the acreage has been cleared. There are a few eroded areas. The slope and erosion hazards are the main limitations of these soils for farming.

Because of slope, the erosion hazard, and low natural fertility, this map unit has poor potential for cultivated crops. It has good potential for pasture and woodland and fair potential for residential and other urban uses.

11. Sawyer-Sacul

Deep, nearly level to rolling, moderately well drained soils that have a clayey subsoil; formed in marine sediment

These nearly level to rolling soils are scattered throughout the county. They are on hilltops and hillsides of the Coastal Plains.

This map unit makes up about 11 percent of the county. About 47 percent of the unit is Sawyer soils, and 12 percent is Sacul soils. The rest consists of soils of minor extent.

Sawyer soils are at a slightly lower elevation than Sacul soils. Both soils are moderately well drained; they have a high seasonal water table. The Sawyer soils have a surface layer of loam, and the Sacul soils have a surface layer of fine sandy loam. Both soils have a surface layer that is soft and friable when moist.

Of minor extent in this map unit are the poorly drained Smithton, Trebloc, and Mayhew soils in depressions and the moderately well drained Savannah soils on hilltops and hillsides.

Most of this map unit is used for pasture, but some areas are used as woodland. Most of the acreage has been cleared. There are a few eroded areas. Erosion is the main limitation for farming.

Because of the erosion hazard, this map unit has poor potential for cultivated crops, but it has good potential for pasture. The potential for woodland is good. Because of slow permeability, shrink-swell potential, and low bearing strength, this map unit has poor potential for residential and other urban uses.

Broad land use considerations

The map units in the county vary widely in their potential for the main land uses, as described in the section, "Map unit descriptions." The ratings of soil potential reflect the cost of measures needed to overcome limitations and of problems that occur after these measures have been taken. The ratings do not consider location in relation to existing transportation systems or to other kinds of facilities.

Each map unit is rated for cultivated crops, pasture, woodland, and urban uses. Cultivated crops include soybeans, grain sorghum, and wheat. Pasture is land in such improved grasses as bermudagrass or bahiagrass. Woodland is land managed for the production of such tree crops as pine. Urban uses include residential, commercial, and industrial land uses.

The Portland-Desha-Oklared and Guyton-Sardis map units have good potential for cultivated farm crops if drained and protected from flooding. The Sacul-Savannah map unit has a poor potential for cultivated farm crops because of slope and erosion hazard.

The potential for pasture is good on most map units in the county, except for the Oktibbeha-Kipling and Oktibbeha-Saffell map units, which have poor potential for pasture because of erosion and droughtiness.

Most map units in the county have good potential for woodland. Such map units as Guyton-Sardis have equipment use limitations because of wetness, but this limitation can generally be overcome by using special equipment and harvesting tree crops in the drier seasons. Slope is a limitation to equipment use on the steeper soils in the Sacul-Savannah and Saffell-Sacul map units.

About 17,000 acres have been developed for urban use in Hempstead County. Most map units in the county have limitations that affect urban development. Portland-Desha-Oklared and Una-Tuscumbia map units have limitations because of shrink-swell potential and flooding. Some of the map units such as Saffell-Sacul and Sacul-Savannah have limitations because of slope. Proper engineering design can overcome many of the limitations for urban development.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have profiles that are almost alike make up a *soil series*. Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Bowie fine sandy loam, 1 to 3 percent slopes, is one of several phases within the Bowie series.

Some map units are made up of two or more dominant kinds of soil and are called soil associations.

A *soil association* is made up of soils that are geographically associated and are shown as one unit on the map because it is not practical to separate them. A soil association has considerable regularity in geographic pattern and in the kinds of soil that are a part of it. The extent of the soils can differ appreciably from one delineation to another; nevertheless, interpretations can be made for use and management of the soils. Briley-Alaga association, rolling, is an example.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 6, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

Soil descriptions

1—Alaga fine sand, 3 to 8 percent slopes. This soil is deep, well drained to somewhat excessively drained, and gently sloping. It is on hilltops and hillsides of the Coastal Plains. The areas are about 15 to 100 acres or more in size.

Typically, the surface layer is grayish brown fine sand about 9 inches thick. The underlying material is brownish yellow and yellowish brown loamy fine sand to a depth of about 48 inches; reddish yellow loamy fine sand to a depth of about 61 inches; and brownish yellow loamy fine sand that extends to a depth of 80 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is medium acid to very strongly acid throughout, except where the surface layer has been limed. Permeability is rapid, and the available water capacity is low. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Briley and Smithdale soils and a few small eroded areas.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps, and are marked with craters. There are unexploded munitions in the areas.

This soil has poor potential for most cultivated crops. Droughtiness is a severe limitation. Wind erosion is a moderate limitation. Runoff is slow. Suited crops include small grains, grain sorghum, and vegetable crops. This soil is well suited to watermelon production and produces record size melons (fig. 1). If such management practices as minimum tillage, contour cultivation, and terracing are used, clean tilled crops that leave a large amount of residue can be grown yearly on less sloping areas. As the grade of the slope increases, more intensive management is needed. This soil has fair potential for pasture and hay. Adapted pasture plants include bermudagrass and Pensacola bahiagrass. Droughtiness is the main limitation for forage production.

This soil has fair potential for loblolly pine. Woodland is the main use of this soil. Equipment limitations impose a moderate management problem, and seedling mortality is a severe management problem.

This soil has good potential for most urban uses. It has no significant limitations to use as septic tank filter fields or for dwellings, small commercial buildings, and roads and streets. If septic tank filter fields are used, there is a possible hazard of pollution of underground water supplies. Droughtiness is a problem in establishing lawns and shrubs. Capability unit IVs-1; woodland suitability group 3s3; pasture and hayland group 9A.

2—Bowie fine sandy loam, 1 to 3 percent slopes. This soil is deep, moderately well drained, and nearly level. It is on hilltops and convex hillsides of the Coastal Plains. The areas are about 5 to 100 acres in size.

Typically, the surface layer is brown fine sandy loam about 7 inches thick. The upper part of the subsoil is yellowish brown fine sandy loam; it extends to a depth of about 16 inches. The middle part of the subsoil is yellowish brown sandy clay loam; it extends to a depth of 31 inches. The lower part is yellowish brown mottled sandy clay loam; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is medium. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Savannah, Ora, and Sacul soils and areas that have slopes greater than 3 percent.

Some of this map unit is in a former munitions-impact area, the boundaries of which are shown on the soil maps. These areas are marked with craters. Unexploded munitions may be in some areas.

This soil has good potential for cultivated crops. The main crops are soybeans and grain sorghum. Other suitable crops are small grains, vegetable crops, and cotton. Runoff is slow, and erosion is a moderate hazard. Clean tilled crops that leave large amounts of residue can be grown yearly with contour cultivation and good management. This soil has good potential for pasture and hay, which is the main use (fig. 2). Adapted pasture plants include bermudagrass, Pensacola bahiagrass, tall fescue, and crimson clover. There are no significant limitations.

This soil has good potential for loblolly pine and shortleaf pine. There are no significant limitations for woodland use or management.

This soil has fair to good potential for most urban uses. It has no significant limitations for dwellings and small commercial buildings, but it has severe limitations for use as septic tank filter fields because of slow percolation. Proper design of the filter field can partially overcome this limitation. Capability unit IIe-1; woodland suitability group 3o1; pasture and hayland group 8A.

3—Bowie fine sandy loam, 3 to 8 percent slopes. This soil is deep, moderately well drained, and gently sloping. It is on ridgetops and side slopes of the Coastal Plains. The areas are about 10 to 100 acres in size.

Typically, the surface layer is brown fine sandy loam about 7 inches thick. The upper part of the subsoil is yellowish brown fine sandy loam; it extends to a depth of about 16 inches. The middle part is yellowish brown sandy clay loam; it extends to a depth of about 31 inches. The lower part is yellowish brown mottled sandy clay loam; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid to very strongly acid throughout except where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is medium. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Savannah, Ora, Sacul, and Smithdale soils. Also included are a few eroded areas.

Some of this map unit is in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has fair potential for cultivated crops. The main cultivated crops are soybeans and grain sorghum. Runoff is medium, and erosion is a moderate hazard. With good management, which includes contour cultivation and terracing long slopes, clean tilled crops that leave a large amount of residue can be grown on the less sloping areas. As slope gradient and length increase, more intensive management will be needed. Other suitable crops are small grains, vegetable crops, and cotton. This soil has good potential for pasture and hay. Adapted pasture plants include bermudagrass, Pensacola bahiagrass, tall fescue, and crimson clover.

This soil has good potential for loblolly pine and shortleaf pine. Woodland is the main use. There are no significant limitations to woodland use or management.

This soil has fair potential for most urban uses. There are no significant limitations for dwellings and small commercial buildings, but the soil has severe limitations for use as septic tank filter fields because of slow percolation. Proper design of the filter field can help overcome this limitation. Capability unit IIIe-1; woodland suitability group 3o1; pasture and hayland group 8A.

4—Briley loamy fine sand, 3 to 8 percent slopes. This soil is deep, well drained, and gently sloping. It is on hilltops and hillsides of the Coastal Plains. The areas are about 5 to 80 acres in size.

Typically, the surface layer is pale brown and light yellowish brown loamy fine sand about 19 inches thick. The subsurface layer is reddish yellow loamy fine sand; it extends to a depth of about 31 inches. The upper part of the subsoil is yellowish red sandy clay loam; it extends to a depth of about 53 inches. The lower part of the subsoil is yellowish red mottled fine sandy loam; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. It is medium acid to very strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and the available water capacity is medium. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Alaga and Smithdale soils. Also included were a few small areas that have slopes of greater than 8 percent and a few eroded areas.

Some of this map unit is in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has good potential for vegetable and truck crops. Adapted cultivated crops include watermelon, cantaloupe, okra, snap beans, and peas. Droughtiness is the main limitation. Wind and water erosion are moderate hazards on clean tilled areas. Crop rotation, stripcropping, and terracing are practices that reduce erosion. This soil has fair potential for pasture. Adapted pasture plants include bahiagrass, hybrid bermudagrass, tall fescue, and sericea lespedeza.

This soil has good potential for loblolly pine, which is its main use. Seedling mortality is a severe management problem.

This soil has good potential for urban uses. There are no significant limitations for septic tank absorption fields, dwellings, and small commerical buildings. Roads and streets have a moderate limitation due to low strength. Proper engineering design can overcome this limitation. Capability unit IIIe-2; woodland suitability group 3s3; pasture and hayland group 9A.

5—Briley-Alaga association, rolling. This association consists of deep, well drained to somewhat excessively drained soils in a regular repeating pattern on rolling hillsides and narrow hilltops. The Briley and Alaga soils formed in thick beds of sandy and loamy sediment of the Coastal Plains. Slopes range from 8 to 20 percent. Mapped areas range from about 100 to 200 acres in size.

The well drained, deep Briley soils make up about 50 percent of this association. Typically, the surface layer is pale brown and light yellowish brown loamy fine sand about 19 inches thick. The subsurface layer is reddish yellow loamy fine sand; it extends to a depth of about 31 inches. The upper part of the subsoil is yellowish red sandy clay loam; it extends to a depth of about 53 inches. The lower part of the subsoil is yellowish red, mottled fine sandy loam; it extends to a depth of 72 inches or more.

Briley soils have moderate permeability, and the available water capacity is medium. Natural fertility and organic matter content are low. The soil is medium acid to very strongly acid throughout except where the surface layer has been limed. Pasture crops on this soil respond well to fertilizer.

The well drained to somewhat excessively drained, deep Alaga soils make up about 25 percent of this association. Typically, the surface layer is grayish brown fine sand about 9 inches thick. The underlying material is brownish yellow and yellowish brown loamy fine sand to a depth of about 48 inches; reddish yellow loamy fine sand to a depth of about 61 inches; and brownish yellow loamy fine sand that extends to a depth of 80 inches or more.

Alaga soils have rapid permeability and low available water capacity. Natural fertility and organic matter content are low. Reaction is medium acid to very strongly acid throughout except where the surface layer has been limed. Pasture crops on this soil respond well to fertilizer.

Included in mapping are a few small areas of Bowie, Sacul, and Smithdale soils.

Some of this map unit is in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This association has poor potential for cultivated crops and fair potential for pasture. Adapted pasture plants include bahiagrass and hybrid bermudagrass. The slope severely restricts the use of equipment, and erosion is a severe hazard. Low available water capacity is a severe limitation for forage production during summer months.

This association is used mainly for woodland. The Briley soils have good potential for loblolly pine. Alaga soils have fair potential for loblolly pine. Equipment management is a moderate management problem, and seedling mortality is a severe management problem.

This association has good potential for most urban uses. There are no significant limitations for septic tank absorption fields, dwellings, and small commercial buildings. Because of low bearing strength, roads and streets have a moderate limitation. Proper engineering design generally can overcome this limitation. On the steeper parts of this association, the potential for urban use is fair because of moderate to severe limitations caused by steep slopes. Proper engineering design can generally overcome these limitations. Briley soil in capability unit VIe-4; woodland suitability group 3s3; pasture and hayland group 9A. Alaga soil in capability unit VIs-1; woodland suitability group 3s3; pasture and hayland group 9A.

6—Demopolis silty clay loam, gullied. This soil is shallow, well drained, and gently sloping to moderately sloping. It is on hilltops and hillsides of the Blackland Prairies. Slopes are 3 to 12 percent. Erosion has removed most of the topsoil; a few rills, shallow gullies, and deep gullies occur. Remnants of identifiable soil remain between the gullies. The areas are about 10 to 100 acres in size.

Typically, the surface layer is grayish brown silty clay loam about 4 inches thick. The underlying material extends to a depth of about 10 inches; it is light brownish gray very gravelly silty clay loam, containing about 70 percent by volume of chalk fragments. Below 10 inches there is rippable chalk.

This soil is moderate in natural fertility and in organic matter content. Reaction is moderately alkaline and calcareous throughout. Permeability is moderately slow, and the available water capacity is low. The soil has poor tilth and can be worked only within a narrow range of moisture content. The root zone is shallow.

Included with this soil in mapping are a few small areas of Sumter, Houston, and Oktibbeha soils. Also included are small areas with gravelly and very gravelly surface layer texture.

This soil is not suited for cultivated crops. Runoff is rapid, and the erosion hazard is very severe. Limitations include shallow rooting depth, gullies, and slope. This soil has fair potential for pasture and range. Adapted pasture plants include hybrid bermudagrass, tall fescue, white clover, and sericea lespedeza. Adapted range plants include little bluestem, big bluestem, switchgrass, and Indiangrass. Minimum tillage, terraces, and contour strips are practices that help reduce runoff and control erosion. Pasture plants on this soil respond well to nitrogen and potash but poorly to phosphate.

This soil has fair potential for eastern redcedar. If this soil is disturbed through the planting and harvesting of trees, erosion can occur, and gullies limit equipment management. Because of very low available water capacity, seedling mortality is severe. These limitations are difficult to overcome.

This soil has poor potential for urban uses. The slow permeability and depth to rock are severe limitations for septic tank absorption fields. These limitations are difficult to overcome. Shallow depth to rock is a severe limitation for dwellings and small commercial buildings, and it is a moderate limitation for roads and streets. Proper engineering design generally can overcome these limitations. Capability unit VIe-6; woodland suitability group 4d3; pasture and hayland group 17A.

7—Desha clay, occasionally flooded. This soil is deep, somewhat poorly drained, and level. It is in slack-water areas in the flood plains of the Red River and its major tributaries. Slopes are 0 to 1 percent. The areas are about 80 to 200 acres in size.

Typically, the surface layer is dark reddish brown clay about 4 inches thick. The upper part of the subsoil is dark reddish brown clay; it extends to a depth of about 27 inches. The lower part of the subsoil is dark reddish brown mottled clay; it extends to a depth of 72 inches or more.

This soil is high in natural fertility and in organic matter content. Reaction is slightly acid to mildly alkaline throughout. This soil cracks when dry and swells when wet. Permeability is very slow, and the available water capacity is high. The water table is seasonally high and within 12 inches of the surface late in winter and early in spring. This soil is flooded about once in 2 years, between December and May for a period of 1 day to 7 days. This soil responds well to fertilizer. If the soil is tilled when wet, clods form on the surface.

Included with this soil in mapping are a few small areas of Latanier and Portland soils and soils similar to this Desha soil except that they are calcareous throughout and have a dark gray surface layer.

This soil has good potential for cultivated crops. Adapted crops include rice, soybeans, and grain sorghum. Runoff is very slow, and sheet erosion is a slight hazard. Occasional flooding and wetness are the main limitations. Flood control projects and surface drainage generally can overcome these limitations. This soil has good potential for pasture, which is the main use. Adapted pasture plants include bahiagrass, hybrid bermudagrass, tall fescue, and white clover. The main limitation is wetness, and this generally can be overcome by drainage and limiting grazing during wet seasons.

This soil has fair potential for green ash, eastern cottonwood, sweetgum, and water oak. Wetness and flooding limit the use of equipment in managing and harvesting tree crops, but this generally can be overcome by using special equipment and harvesting during the drier seasons.

This soil has poor potential for most urban uses. The flooding, very slow permeability, and wetness are severe limitations for septic tank absorption fields. These limitations are difficult to overcome. Flooding, shrink-swell, and low strength are severe limitations for dwellings, small commercial buildings, streets, and roads. These limitations generally can be overcome by flood control measures, surface drainage, and proper engineering design. Capability unit IVw-2; woodland suitability group 3w6; pasture and hayland group 1A.

8—**Gore silt loam, 0 to 2 percent slopes.** This soil is deep, moderately well drained, and nearly level. It is on broad terraces. The areas are about 150 to 500 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsoil is brown loam to a depth of about 8 inches; red clay to a depth of about 20 inches; gray and red mottled clay to a depth of about 57 inches. The underlying material is red clay; it extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. The surface layer is medium acid or strongly acid unless it has been limed. The upper part of the subsoil is strongly acid or very strongly acid, and the lower part is very strongly acid to mildly alkaline. The underlying material is medium acid to moderately alkaline. Permeability is very slow, and the available water capacity is high. When dry, this soil shrinks and cracks, and when the soil is wet the cracks seal. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of McKamie soils and soils similar to this Gore soil except that they are grayer and more poorly drained.

This soil has good potential for growing cultivated crops, which is the main use. It is suited to rice, soybeans, and grain sorghum. Surface runoff is medium and erosion is a moderate hazard. Contour cultivation helps reduce the erosion hazard. In winter and spring, wetness is a hazard. Farming is delayed several days on the flatter slopes after spring and fall rains, unless surface drains are installed. The clayey subsoil restricts root penetration and movement of water through the soil. The soil has good potential for pasture. Adapted pasture plants include bermudagrass, tall fescue, and white clover.

This soil has fair potential for loblolly pine. In winter and spring, wetness is a moderate limitation for equipment use in managing and harvesting tree crops, but this generally can be overcome by using special equipment and harvesting during the drier seasons.

This soil has poor potential for most urban uses. The very slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. When this soil is wet, shrink-swell potential and low strength are severe limitations for dwellings, small commercial buildings, streets, and roads. These limitations generally can be overcome by proper engineering design. Capability unit IVe-1; woodland suitability group 3c2; pasture and hayland group 8C.

9—**Guyton silt loam, occasionally flooded.** This soil is deep, poorly drained, and level on flood plains of the Coastal Plains. Slopes are 0 to 1 percent. The areas are about 10 to 100 acres in size.

Typically, the surface layer is light brownish gray mottled silt loam about 7 inches thick. The subsurface layer is gray mottled silt loam; it extends to a depth of about 16 inches. The upper part of the subsoil is gray mottled silt loam; it extends to a depth of about 39 inches. The lower part of the subsoil is dark gray mottled loam; it extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from very strongly acid to medium acid in the surface layer and the upper part of the subsoil. Reaction in the lower subsoil ranges from very strongly acid through moderately alkaline. Permeability is slow, and the available water capacity is high. Guyton soils generally are flooded about once in 2 years for periods ranging from 1 to 3 days. Water ponds on this soil during wet periods, and a seasonal water table occurs at the surface during the winter and spring months. Tilth is easy to maintain, and this soil responds well to fertilizer.

Included with this soil in mapping are a few small areas of Bowie soils, which are similar to Guyton soils except that Guyton soils have a higher sodium content. Also included are areas of soils that are not subject to flooding.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are drawn on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has fair potential for cultivated crops. Adapted crops include soybeans, grain sorghum, and small grains. Occasional flooding and wetness are the main limitations. Flood control projects and surface drainage can partially overcome these limitations. This soil has fair potential for pasture. The main limitations are flooding and wetness. Adapted pasture plants include common bermudagrass, tall fescue, and white clover.

This soil has good potential for loblolly pine and sweetgum. Woodland is the main use of this soil. Wetness and flooding limit the use of equipment in managing and harvesting trees, but using special equipment and harvesting during the drier season generally can overcome these limitations.

This soil has poor potential for most urban uses. The flooding, slow permeability, and wetness are severe limitations for septic tank absorption fields, dwellings, small commercial buildings, streets, and roads. Flood control, surface drainage, and proper engineering design can partially overcome these limitations. Capability unit IVw-1; woodland suitability group 2w9; pasture and hayland group 2B.

10—Harleston loamy fine sand, 1 to 3 percent slopes. This soil is deep, moderately well drained, and nearly level. It is on side slopes and low terraces of the Coastal Plains. The areas are about 10 to 100 acres in size.

Typically, the surface layer is brown loamy fine sand about 7 inches thick. The upper part of the subsoil is yellowish brown mottled fine sandy loam; it extends to a depth of about 36 inches. The lower part of the subsoil is fine sandy loam mottled in shades of yellow, brown, red, and gray; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and the available water capacity is medium. In winter and spring, a water table occurs within 2 feet of the surface. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Bowie, Sardis, Savannah, and Smithton soils.

This soil has fair potential for cultivated crops. The main cultivated crops are grain sorghum, soybeans, and small grains. Runoff is slow, and erosion is a moderate hazard. Seasonal wetness is a moderate hazard, but it can be overcome by using adequate surface drainage. Clean tilled crops, which leave large amounts of residue, can be grown yearly with contour cultivation and good management. This soil has good potential for pasture, which is the main use. Adapted pasture plants include tall fescue, white clover, and hybrid bermudagrass.

This soil has good potential for loblolly pine, shortleaf pine, and sweetgum. Wetness limits the use of equipment in managing and harvesting trees, but this limitation can generally be overcome by harvesting and planting during the drier seasons.

This soil has fair potential for most urban uses. The wetness is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. The wetness is a moderate limitation for dwellings and a severe limitation for small commercial buildings. These limitations can generally be overcome by installing drainage systems and by proper engineering design. There are no significant limitations for roads and streets. Capability unit IIe-1; woodland suitability group 2w8; pasture and hayland group 8A.

11—Harleston loamy fine sand, 3 to 8 percent slopes. This soil is deep, moderately well drained, and gently sloping. It is on ridgetops and side slopes of the Coastal Plains. The areas are about 10 to 100 acres in size.

Typically, the surface layer is brown loamy fine sand about 7 inches thick. The upper part of the subsoil is a yellowish brown mottled sandy loam; it extends to a depth of about 36 inches. The lower part of the subsoil is a fine sandy loam mottled in shades of yellow, brown, and gray; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and the available water capacity is medium. During winter and spring, a water table occurs within 2 feet of the surface. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Bowie, Sawyer, and Savannah soils. Also included are a few small areas that have slopes of less than 3 percent and a few small areas that have slopes of greater than 8 percent.

This soil has fair to poor potential for cultivated crops. The main cultivated crops are grain sorghum and small grains. Runoff is medium, and erosion is a severe hazard. Seasonal wetness is a moderate hazard. If contour cultivation, terracing of long slopes, and good management are used, clean-tilled crops, which leave a large amount of residue, can be grown yearly on the more gently sloping parts. As slope gradient and length increase, more intensive management is needed. This soil has good potential for pasture, which is the main use. Adapted pasture plants include hybrid bermudagrass, bahiagrass, tall fescue, and white clover.

This soil has good potential for loblolly pine, shortleaf pine, and sweetgum. Wetness limits the use of equipment in managing and harvesting trees, but this limitation can generally be overcome by harvesting and planting during the drier seasons.

This soil has fair to poor potential for most urban uses. The wetness is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. The wetness is a moderate limitation for dwellings, and a severe limitation for small commercial buildings. Using drainage systems and proper engineering design can help to overcome these limitations. There are no significant limitations for roads and streets. Capability unit IIIe-1; woodland suitability group 2w8; pasture and hayland group 8A.

12—Houston clay, 1 to 3 percent slopes. This soil is deep, moderately well drained, and nearly level. It is on hilltops in the Blackland Prairie areas. The areas range from about 10 to 100 acres in size.

Typically, the surface layer is very dark gray clay about 7 inches thick. The subsurface layer is dark olive gray clay that extends to a depth of about 22 inches. The upper part of the underlying material is olive mottled clay; it extends to a depth of about 52 inches. The lower part of the underlying material is light olive brown mottled clay; it extends to a depth of 72 inches or more.

This soil is high in natural fertility and in organic matter content. The surface layer, subsurface layer, and the upper part of the underlying material are slightly acid to moderately alkaline. The lower part of the underlying material ranges from slightly acid to moderately alkaline and generally is calcareous. Permeability is slow, and the available water capacity is high. These soils have a high shrink-swell potential (fig. 3). Tilth is difficult to maintain because of the clayey surface. Crops respond well to nitrogen and potash but poorly to phosphate.

This soil has good potential for cultivated crops, which are the main use. The main crops are soybeans, grain sorghum, and cotton. Fallowing the soil improves tilth. Runoff is medium, and erosion is a moderate hazard. If contour cultivation and good management are used, clean tilled crops that leave large amounts of residue can be grown yearly. This soil has good potential for pasture. Adapted pasture plants include annual lespedeza, sericea lespedeza, tall fescue, white clover, alfalfa, and hybrid bermudagrass. This soil has good potential for rangeland. Adapted range plants include little bluestem, big bluestem, indiangrass, and purpletop.

This soil has fair potential for eastern redcedar. The clayey texture, when wet, restricts the use of equipment in managing and harvesting trees. Planting and harvesting in the drier seasons can partially overcome this limitation.

This soil has poor potential for most urban uses. The slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. The shrink-swell potential and low strength of the soil are severe limitations for dwellings, small commercial buildings, and roads and streets. Proper engineering design can overcome some of these limitations. Capability unit IIe-2; woodland suitability group 4c2; pasture and hayland group 7C.

13—**Houston clay, 3 to 8 percent slopes, eroded.** This soil is deep, moderately well drained, and gently sloping. It is on hillsides in the Blackland Prairie area. Erosion has removed most of the topsoil, and a few shallow rills have formed. The areas are about 10 to 100 acres in size.

Typically, the surface layer is very dark gray clay about 7 inches thick. The subsurface layer is dark olive gray clay; it extends to a depth of about 22 inches. The upper part of the underlying material is olive mottled clay; it extends to a depth of about 52 inches. The lower part of the underlying material is light olive brown mottled clay; it extends to a depth of 72 inches or more.

This soil is high in natural fertility and in organic matter content. The surface layer, subsurface layer, and the upper part of the underlying material are slightly acid to moderately alkaline. The lower underlying material ranges from slightly acid to moderately alkaline, and it generally is calcareous. Permeability is slow, and the available water capacity is high. These soils shrink and crack as they dry; when wet, they expand and the cracks seal. Tilth is difficult to maintain because of the clayey surface texture. Crops respond well to nitrogen and potash but poorly to phosphate.

Included with this soil in mapping are a few small areas of Demopolis and Sumter soils and a few small areas that have slopes of 8 to 12 percent.

Some of this map unit is in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has poor potential for cultivated crops. The main cultivated crops are grain sorghum and soybeans. Erosion is a very severe hazard, and runoff is rapid. Fallowing helps to improve tilth, but this practice contributes to erosion. Clean tilled crops that leave a large amount of residue can be grown in rotation with hay and pasture crops if contour cultivation, minimum tillage, and other good management practices are used. As the grade and length of slope increase, more intensive management is needed. This soil has good potential for pasture. Adapted pasture plants include annual lespedeza, sericea lespedeza, tall fescue, white clover, and hybrid bermudagrass.

This soil has fair potential for eastern redcedar. The clayey texture restricts the use of equipment in managing and harvesting trees when the soil is wet. Planting and harvesting during the drier seasons can partially overcome this limitation.

This soil has poor potential for most urban uses. The slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. The high shrink-swell potential and low strength of the soil are severe limitations for dwellings, small commercial buildings, and roads and streets. Some of these limitations generally can be overcome by proper engineering design. Capability unit IVe-2; woodland suitability group 4c2; pasture and hayland group 7C.

14—**Kipling loam, 1 to 3 percent slopes.** This soil is deep, somewhat poorly drained, and nearly level. It is on hilltops, in intermingled areas of the Coastal Plains and Blackland Prairies. The areas are about 10 to 100 acres in size.

Typically, the surface layer is brown mottled loam about 6 inches thick. The subsoil is a yellowish brown mottled clay; it extends to a depth of about 54 inches. The underlying material is a mottled light olive brown and gray clay; it extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and in organic matter content. The surface layer and subsoil range from medium acid through extremely acid, except where the surface layer has been limed. The underlying material ranges from strongly acid through moderately alkaline. Permeability is very slow, and the available water capacity is high. As they dry, these soils shrink and crack, and when wet, they expand and the cracks seal. During the winter and spring months a temporary water table occurs within 18 inches of the surface. Tilth is somewhat difficult to maintain. All crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Mayhew, Oktibbeha, Millwood, and Sawyer soils, and Kipling soils that have a clayey surface texture.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has fair potential for cultivated crops. The main cultivated crops are soybeans and grain sorghum. Runoff is slow, and erosion is a severe hazard, but clean tilled crops that leave large amounts of residue can be grown yearly if contour cultivation and good management are used. This soil has good potential for pasture and hay and is used mainly for pasture and hay. Adapted pasture plants include bahiagrass, hybrid bermudagrass, tall fescue, and white clover.

This soil has good potential for loblolly pine, cherrybark oak, Shumard oak, and sweetgum. When the soil is wet the clayey subsoil restricts the use of equipment in managing and harvesting trees. Using special equipment and planting and harvesting in the drier seasons can partially overcome this limitation.

This soil has poor potential for most urban uses. The very slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. The high shrink-swell potential and low strength of this soil are severe limitations for dwellings, small commercial buildings, roads, and streets. Proper engineering design can help to overcome these limitations. Capability unit IIIe-4; woodland suitability group 2c8; pasture and hayland group 7C.

15—Kipling silty clay loam, 3 to 8 percent slopes, eroded. This soil is deep, somewhat poorly drained, and gently sloping. It is on hillsides in intermingled areas of the Coastal Plains and Blackland Prairies. Erosion has removed most of the topsoil; a few shallow rills have formed. The areas are about 15 to 100 acres in size.

Typically, the surface layer is a brown mottled silty clay loam about 6 inches thick. The subsoil is a yellowish brown mottled clay; it extends to a depth of about 54 inches. The underlying material is a mottled light olive brown and gray clay; it extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and in organic matter content. The surface layer and subsoil range from medium acid through extremely acid, except where the surface layer has been limed. The underlying material ranges from strongly acid through moderately alkaline. Permeability is very slow, and the available water capacity is high. As they dry, these soils shrink and crack, and when wet, they expand and the cracks seal. In winter and spring, there is a temporary water table within 18 inches of the surface. Tilth is difficult to maintain. Crops on this soil respond well to fertilizer.

Included with this soil in mapping are a few small areas of Houston and Oktibbeha soils. Also included are a few small areas of Kipling soils that have a loam surface layer and slopes of less than 3 percent.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has poor potential for cultivated crops. The main cultivated crops are soybeans and grain sorghum. Runoff is medium to rapid, and erosion is a very severe hazard. If contour cultivation, terracing of long slopes, and good management are used, clean tilled crops that leave large amounts of residue can be grown in rotation. As slope gradient and length increase, more intensive management is needed. This soil has fair to good potential for pasture. Adapted pasture plants include bahiagrass, hybrid bermudagrass, tall fescue, and white clover. Wetness is a limitation during the winter and spring months, because it causes poor trafficability for livestock and farm equipment.

This soil has good potential for loblolly pine, cherrybark oak, Shumard oak, and sweetgum. Poor trafficability when the soil is wet restricts the use of equipment in managing and harvesting trees. Using special equipment and planting and harvesting during the drier seasons can help to overcome this limitation.

This soil has poor potential for most urban uses. The very slow permeability is a severe limitation for septic tank absorption fields. This limitation is very difficult to overcome. The high shrink-swell potential and low strength of the soil are severe limitations for dwellings, small commercial buildings, and roads and streets. Proper engineering design can help to overcome these limitations. Capability unit IVe-4; woodland suitability group 2c8; pasture and hayland group 7C.

16—Kirvin fine sandy loam, 3 to 8 percent slopes. This soil is deep, well drained, and gently sloping. It is on hilltops and hillsides of the Coastal Plains. The areas are 10 to 100 acres in size.

Typically, the surface layer is a brown fine sandy loam about 5 inches thick. The upper part of the subsoil is yellowish red clay loam; it extends to a depth of about 10 inches. The middle part of the subsoil is red clay; it extends to a depth of about 30 inches. The lower part of the subsoil is red, mottled sandy clay and clay; it extends to a depth of about 56 inches. The underlying material is a stratified clay loam mottled in shades of red and brown; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid to extremely acid throughout, except where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is medium. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Ora, Sacul, and Smithdale soils. Also included are soils that are similar to Kirvin soils except that the subsoil exceeds 10 percent ironstone and sandstone fragments, and a few small areas of soils that have slopes of over 8 percent.

This soil has poor potential for cultivated crops. Adapted crops include winter small grains and grain sorghum. Runoff is medium to rapid, and erosion is a very severe hazard. If contour cultivation, terracing of long slopes, and good management are used, clean tilled crops that leave a large amount of residue can be grown occasionally in a cropping system that includes mostly grasses and legumes. This soil has fair potential for pasture and hay. Adapted pasture plants include bermudagrass, Pensacola bahiagrass, tall fescue, crimson clover, annual lespedeza, and sericea lespedeza.

This soil has fair potential for loblolly pine. Its main use is loblolly pine and shortleaf pine forest. There are no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. It has a moderate limitation for dwellings and small commercial buildings because of low strength. Proper engineering design can overcome this limitation. This soil has a severe limitation for septic tank absorption fields because of slow percolation. This limitation can be partially overcome by increasing the size of the absorption field or by using modified engineering design. Capability unit IVe-2; woodland suitability group 3o1; pasture and hayland group 7A.

17—Kirvin fine sandy loam, 8 to 12 percent slopes. This soil is deep, well drained, and moderately sloping. It is on side slopes of the Coastal Plains. The areas are 10 to 100 acres in size.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The upper part of the subsoil is a yellowish red clay loam; it extends to a depth of about 10 inches. The middle part of the subsoil is a red clay; it extends to a depth of about 30 inches. The lower part of the subsoil is a red, mottled sandy clay and clay; it extends to a depth of about 56 inches. The underlying material is stratified clay loam mottled in shades of red and brown; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid to extremely acid throughout, except where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is medium. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Sacul, Smithdale, and Ora soils and soils that are similar to Kirvin soils except that they are thinner and have a subsoil that contains over 10 percent ironstone fragments. Also included are a few eroded areas, and a few areas that have slopes of over 12 percent.

This soil generally is not suited to cultivated crops because the erosion hazard is very severe. Runoff is rapid. The soil has fair potential for pasture and hay. Adapted pasture plants include bermudagrass, Pensacola bahiagrass, crimson clover, annual lespedeza, and sericea lespedeza.

This soil has fair potential for loblolly pine. Its main use is loblolly and shortleaf pine forest. There are no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. It has moderate limitations for dwellings and small commercial buildings because of low strength when the soil is wet. Proper engineering design can overcome this limitation. This soil has severe limitations for septic tank absorption fields because of slow percolation. Increasing the size of the absorption field or using modified engineering designs can partially overcome this limitation. Capability unit VIe-1; woodland suitability group 3o1; pasture and hayland group 7A.

18—Latanier silty clay, occasionally flooded. This soil is deep, somewhat poorly drained, and level to nearly level. It is on flood plains of the Red River. Slopes are 0 to 2 percent. The areas are about 10 to 100 acres in size.

Typically, the surface layer is dark reddish brown silty clay about 7 inches thick. The upper part of the subsoil is dark reddish brown clay that extends to a depth of about 19 inches. The lower part of the subsoil is dark reddish brown silty clay; it extends to a depth of about 26 inches. The underlying material is reddish brown, yellowish red, and reddish yellow stratified silt loam, very fine sandy loam, and very fine sand; it extends to a depth of 72 inches or more.

This soil is high in natural fertility and in organic matter content. It is neutral to moderately alkaline throughout. The subsoil and underlying material generally are calcareous. Permeability is very slow, and the available water capacity is high. This soil generally is flooded about once in 2 years between December and April for periods of about 1 to 3 days. As they dry, these soils shrink and crack, and when they are wet, they expand and the cracks seal. A temporary water table occurs within 12 inches of the surface, usually between December and April. Tilth is difficult to maintain because of the clayey surface texture. Crops on this soil respond well to fertilizer.

Included with this soil in mapping are a few small areas of Desha, Sterlington, and Oklared.

This soil has good potential for cultivated crops. Adapted crops include rice, soybeans, grain sorghum, and cotton (fig. 4). This soil can be tilled only within a narrow range of moisture content. Runoff is slow, and sheet erosion is a slight hazard. Occasional flooding and wetness are the main limitations, which can generally be overcome by flood control projects and surface drainage. This soil has good potential for pasture and hay, which are the main uses. Adapted pasture plants include Pensacola bahiagrass, hybrid bermudagrass, tall fescue, alfalfa, and white clover. The main limitation is wetness. It can generally be overcome by drainage and limiting grazing during wet seasons.

This soil has good potential for eastern cottonwood and American sycamore. Wetness and flooding are moderate limitations for equipment use in management and harvesting of tree crops. These limitations can generally be overcome by using special equipment and harvesting during the drier season.

This soil has poor potential for most urban uses. Flooding, very slow permeability, and wetness are severe limitations for septic tank absorption fields. These limitations are difficult to overcome. Flooding, shrink-swell, and low strength are severe limitations for dwellings, small commercial buildings, and roads and streets. Flood control, surface drainage, and proper engineering design can generally overcome these limitations. Capability unit IVw-2; woodland suitability group 2w5; pasture and hayland group 1A.

19—Latanier silty clay, frequently flooded. This soil is deep, somewhat poorly drained, and level. It is in abandoned Red River channels. Slopes are 0 to 1 percent. The areas are about 5 to 20 acres in size.

Typically, the surface layer is dark reddish brown silty clay about 7 inches thick. The upper part of the subsoil is dark reddish brown clay; it extends to a depth of about 19 inches. The lower part of the subsoil is dark reddish brown silty clay; it extends to a depth of about 26 inches.

The underlying material is reddish brown, yellowish red, and reddish yellow stratified silt loam, very fine sandy loam, and very fine sand; it extends to a depth of 72 inches or more.

This soil is high in natural fertility and in organic matter content. The surface layer is neutral to moderately alkaline throughout, and the subsoil and underlying material generally are calcareous. Permeability is very slow, and the available water capacity is high. This soil generally is flooded yearly for brief to extended periods between December and April. This soil shrinks and cracks as it dries, and when wet it expands and the cracks seal. The seasonal water table is within 12 inches of the surface from December through April. Tilth is difficult to maintain because of the clayey surface texture. All crops on this soil respond well to fertilizer.

Included with this soil in mapping are a few small areas of Desha and Portland soils. Also included are a few small areas of water and of sandy overwash.

This soil has poor potential for cultivated crops. Adapted crops include rice, soybeans, and grain sorghum. This soil can be tilled only within a narrow range of moisture content. Frequent flooding, wetness, and ponding of water in depressions are the main limitations. Flood control projects and drainage measures can partially overcome these limitations. This soil has fair potential for pasture and hay, which are the main use. Adapted pasture plants include Pensacola bahiagrass, hybrid bermudagrass, tall fescue, and white clover. The main limitations are flooding and wetness. These limitations generally can be overcome by drainage, flood control, and limiting grazing during the wet seasons.

This soil has good potential for eastern cottonwood and American sycamore. Wetness and flooding are moderate limitations for woodland use and management. Using special equipment and harvesting during the drier season can help to overcome these limitations.

This soil is not suited to urban uses. Frequent flooding, ponding of water, very slow permeability, and wetness are severe limitations for use as septic tank absorption fields. Frequent flooding, ponding of water, shrink-swell, and low strength are severe limitations for use as sites for dwellings, small commercial buildings, and roads and streets. These limitations are difficult or impractical to overcome. Capability unit Vw-1; woodland suitability group 2w5; pasture and hayland group 1A.

20—**Marietta loam, occasionally flooded.** This soil is deep, moderately well drained, and level. It is on flood plains of streams draining intermingled areas of the Blackland Prairies and Coastal Plains. Slopes are 0 to 1 percent. The areas are 15 to 100 acres in size.

Typically, the surface layer is brown loam about 7 inches thick. The upper part of the subsoil is brown loam; it extends to a depth of about 15 inches. The lower part of the subsoil is gray mottled loam; it extends to a depth of about 42 inches. The underlying material is gray, mottled silty clay loam or clay loam; it extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Reaction ranges from medium acid through mildly alkaline. Permeability is moderate, and the available water capacity is high. This soil usually is flooded about once in 2 years between December and April, for periods of about 1 to 3 days. A seasonal water table is within 2 feet of the surface during winter and spring. Crops repond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Tuscumbia soils and soils similar to Marietta soils except they have a thick sandy surface layer.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has good potential for cultivated crops. Adapted crops include soybeans, grain sorghum, and small grains. Runoff is slow, and sheet erosion is a slight hazard. Occasional flooding and wetness are the main limitations for crops. Flood control projects and drainage systems can help to overcome these limitations. This soil has a good potential for pasture and hay, which are the main uses. Adapted pasture plants include tall fescue, white clover, bermudagrass, and Pensacola bahiagrass. The main limitation is wetness. This limitation generally can be overcome by drainage systems and by limiting grazing during wet seasons.

This soil has good potential for eastern cottonwood, sweetgum, yellow-poplar, green ash, and sycamore. Wetness and flooding are limitations to the use of equipment in managing and harvesting trees. This limitation generally can be overcome by using special equipment and harvesting during drier periods.

This soil has poor potential for most urban uses. Flooding and wetness are severe limitations for septic tank absorption fields, dwellings, small commercial buildings, and roads and streets. Flood control, drainage systems, and proper engineering design can help to overcome these limitations. Capability unit IIw-1; woodland suitability group 1w5; pasture and hayland group 2B.

21—**Mayhew silty clay loam, 0 to 2 percent slopes.** This soil is deep, poorly drained, and nearly level. It is on broad ridgetops in intermingled areas of the Coastal Plains and Blackland Prairies. The areas are about 10 to 100 acres in size.

Typically, the surface layer is grayish brown silty clay loam about 6 inches thick. The upper part of the subsoil is a gray, mottled clay; it extends to a depth of about 49 inches. The lower part of the subsoil is a gray, mottled silty clay loam; it extends to 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is medium acid to very strongly acid throughout, except where the surface layer has been limed. Permeability is very slow, and the available water capacity is high. These soils shrink and crack when they dry. They expand when wet, and the cracks seal. A seasonal water table is at or near the surface during winter and spring. Tilth is difficult to maintain because of the clayey texture. If lime is adequately applied, crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Kipling, Sacul, Sawyer, and Trebloc soils. Also included are a few areas of Mayhew soils that have a surface layer of silt loam.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has poor potential for cultivated crops. The main cultivated crops are grain sorghum, soybeans, and small grains. Runoff is slow, and erosion is a slight to moderate hazard. The surface layer is thin, and root penetration into the subsoil is slow. Wetness is the main limitation for cultivated crops. This limitation generally can be overcome by using drainage systems. This soil has a fair potential for pasture and hay. Adapted pasture plants include tall fescue, white clover, and bermudagrass.

This soil has fair to good potential for loblolly pine and sweetgum. The clayey texture and wetness severely limit the use of equipment in managing and harvesting trees. Using special equipment and planting and harvesting during the drier seasons can help to overcome these limitations.

This soil has poor potential for most urban uses. The slow permeability and wetness are severe limitations for use as septic tank absorption fields. These limitations are difficult to overcome. The high shrink-swell potential, wetness, and low strength of the soil are severe limitations for dwellings, small commercial buildings, and roads and streets. These limitations generally can be overcome by using proper engineering design. Capability unit IIIw-2; woodland suitability group 2w9; pasture and hayland group 7C.

22—McKamie silty clay loam, 3 to 8 percent slopes, eroded. This soil is deep, well drained, and gently sloping. It is on dissected side slopes of terraces paralleling the Red River. Erosion has removed most of the topsoil; a few shallow rills have formed. The areas are 10 to 400 acres in size.

Typically, the surface layer is brown silty clay loam about 4 inches thick. The upper part of the subsoil is red clay or silty clay; it extends to a depth of about 38 inches. The lower part of the subsoil is yellowish red silt loam; it extends to a depth of about 49 inches. The underlying material is yellowish red silt loam or very fine sandy loam; it extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction of the surface layer is medium acid or strongly acid. In the upper part the subsoil is medium acid to very strongly acid, and in the lower part it is mildly alkaline or moderately alkaline. The underlying material is very strongly acid through moderately alkaline. Permeability is very slow, and the available water capacity is high. This soil shrinks and cracks when it is dry, and it expands and the cracks seal when it is wet. Tilth is difficult to maintain because of the clayey surface layer. Crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Gore and Sacul soils. Also included are a few areas of McKamie soils that have a surface layer of silt loam or fine sandy loam.

This soil has poor potential for cultivated crops. The main cultivated crops are small grains and grain sorghum. Runoff is medium to rapid, and erosion is a very severe hazard. The surface layer is thin, and the clayey subsoil restricts root penetration and movement of water through the soil. If contour cultivation, terracing of long slopes, and good management are used, clean tilled crops that leave large amounts of residue can be grown in rotation. As slope gradient and length increase, more intensive management is needed. This soil has fair potential for pasture and hay. Adapted pasture plants include bermudagrass, Pensacola bahiagrass, tall fescue, crimson clover, annual lespedeza, and sericea lespedeza.

This soil has good potential for loblolly pine and shortleaf pine and is used mainly for growing these trees. When the soil is wet, strength of the subsoil is a moderate limitation for equipment use in managing and harvesting tree crops, but this limitation generally can be overcome by using special equipment and harvesting during dry seasons.

This soil has poor potential for most urban uses. Very slow permeability is a severe limitation for septic tank absorption fields. This limitation can sometimes be overcome by special engineering design or by increasing the size of the absorption field. When this soil is wet, the high shrink-swell potential and low strength of the soil are severe limitations for dwellings, small commercial buildings, and roads and streets. These limitations can usually be overcome by proper engineering design. Capability unit IVe-2; woodland suitability group 3c2; pasture and hayland group 7A.

23—McKamie fine sandy loam, 8 to 12 percent slopes. This soil is deep, well drained, and moderately sloping. It is on dissected side slopes of terraces paralleling the Red River. The areas are 10 to 100 acres in size.

Typically, the surface layer is brown silty clay loam about 4 inches thick. The upper part of the subsoil is red clay or silty clay; it extends to a depth of about 38 inches. The lower part of the subsoil is yellowish red silt loam; it extends to a depth of about 49 inches. The underlying material is yellowish red, stratified silt loam or very fine sandy loam; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction of the surface layer is medium acid or strongly acid. In the upper part the subsoil is medium acid to very strongly acid, and in the lower part it is mildly alkaline or moderately alkaline. The underlying material is very strongly acid through moderately alkaline. Permeability is very slow, and the available water capacity is high. This soil shrinks and cracks when the soil is dry, and it expands and the cracks seal when the soil is wet. Tilth is difficult to maintain because of the clayey texture. Crops respond well to fertilizer.

This soil has poor potential for cultivated crops. The main cultivated crops are small grains. Runoff is rapid, and erosion is a very severe hazard. The surface layer is thin, and the clayey subsoil restricts root penetration and the movement of water through the soil. This soil has fair potential for pasture and hay. Adapted pasture plants include bermudagrass, Pensacola bahiagrass, tall fescue, and crimson clover. Crops on this soil respond well to fertilizer.

This soil has good potential for loblolly and shortleaf pine and is mainly used for growing these trees. When the soil is wet, low bearing strength of the subsoil is a moderate limitation for equipment use in managing and harvesting trees. This limitation generally can be overcome by using special equipment and harvesting during dry periods.

This soil has poor potential for most urban uses. The very slow permeability is a severe limitation for septic tank absorption fields. In places this limitation can be overcome by using special engineering designs or by increasing the size of the absorption field. The high shrink-swell potential and low strength of the soil are severe limitations for dwellings, small commercial buildings, and roads and streets. These limitations generally can be overcome by proper engineering design. Capability unit VIe-1; woodland suitability group 3c2; pasture and hayland group 7A.

24—Millwood silt loam, 3 to 8 percent slopes. This soil is deep, well drained, and gently sloping. It is on ridgetops and side slopes in intermingled areas of the Coastal Plains and Blackland Prairies. The areas are 10 to 200 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The upper part of the subsoil is red, mottled clay; it extends to a depth of about 44 inches. The middle part of the subsoil is gray, mottled clay; it extends to a depth of about 57 inches. The lower part of the subsoil is yellowish brown clay; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is very slow, and the available water capacity is high. When the soil is dry the subsoil shrinks and cracks, and when the soil is wet, it expands and the cracks seal. Tilth is easy to maintain and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Oktibbeha, Kipling, Mayhew, and Sawyer soils. Also included are a few eroded areas and a few areas that have slopes of more than 8 percent.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has poor potential for cultivated crops. The main cultivated crops are small grains and grain sorghum. Runoff is rapid, and erosion is a very severe hazard. The surface layer is thin, and root penetration into the subsoil is slow. If contour cultivation, terracing of long slopes, and good management are used, clean tilled crops that leave a large amount of residue can be grown in rotation with grasses and legumes. As slope gradient and length increase, more intensive management is needed. This soil has a fair potential for pasture and hay. Adapted pasture plants include bermudagrass, Pensacola bahiagrass, tall fescue, white clover, and crimson clover (fig. 5).

This soil has good potential for loblolly pine and shortleaf pine. When the soil is wet, the clayey subsoil restricts the use of equipment in managing and harvesting trees. This limitation can be partially overcome by using special equipment and by planting and harvesting during dry periods.

This soil has poor potential for most urban uses. Very slow permeability is a severe limitation for septic tank absorption fields. The high shrink-swell potential and low strength of the soil are severe limitations for dwellings, small commercial buildings, and roads and streets. Proper engineering design generally can overcome these limitations. Capability unit IVe-2; woodland suitability group 3c2; pasture and hayland group 7A.

25—Oklared very fine sandy loam. This soil is deep, well drained, and level to nearly level. It is on flood plains of the Red River. Slopes are 0 to 2 percent. The areas are about 5 to 100 acres in size.

Typically, the surface layer is yellowish red very fine sandy loam about 8 inches thick. The underlying material extends to a depth of 72 inches or more; it is reddish yellow and yellowish red, stratified very fine sandy loam.

This soil is high in natural fertility and low in organic matter content. Reaction is mildly alkaline or moderately alkaline throughout. Permeability is moderately rapid, and the available water capacity is high. This soil occurs in areas that are protected from flooding by a levee. Crops respond well to fertilizer and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Latanier and Sterlington soils.

This soil has good potential for growing cultivated crops, which is the main use. Cotton, soybeans, grain sorghum, and small grains are the main crops. Runoff is slow, and sheet erosion is a slight hazard. If good management is used, clean tilled crops that leave a large amount of residue can be grown yearly. This soil has good potential for pasture and hay. Adapted pasture plants include bermudagrass, alfalfa, Pensacola bahiagrass, crimson clover, and annual lespedeza.

This soil has good potential for eastern cottonwood, American sycamore, pecan, black walnut, and sweetgum. There are no significant limitations for woodland use and management.

This soil has good potential for most urban uses. There are no significant limitations for dwellings and small commercial buildings. Low strength is a moderate limitation for roads and streets. Proper engineering design generally can overcome this limitation. Capability unit I-1; woodland suitability group 2o4; pasture and hayland group 2A.

26—Oklared very fine sandy loam, occasionally flooded. This soil is deep, well drained, and level to nearly level. It is on flood plains of the Red River. Slopes are 0 to 2 percent. The areas are 10 to 100 acres in size.

Typically, the surface layer is yellowish red very fine sandy loam about 8 inches thick. The underlying material is reddish yellow and yellowish red, stratified fine sandy loam; it extends to a depth of 72 inches or more.

This soil is high in natural fertility and low in organic matter content. Reaction is mildly alkaline or moderately alkaline throughout. Permeability is moderately rapid, and the available water capacity is high. This soil usually is flooded about once every 2 years. These floods last about 1 to 3 days. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Latanier soils and areas of soils that are similar to Oklared soils except that they have a silty clay loam surface layer.

This soil has fair potential for cultivated crops. Cotton, soybeans, grain sorghum, and small grains are the main crops. Runoff is slow, and sheet erosion is a slight hazard. Flooding is the main limitation for cultivated crops. If good management is used, clean tilled crops that leave a large amount of residue can be grown yearly. This soil has good potential for pasture and hay and is used mainly for pasture and hay. Adapted pasture plants include bermudagrass, crimson clover, and Pensacola bahiagrass.

This soil has good potential for eastern cottonwood, American sycamore, pecan, black walnut, and sweetgum. There are no significant limitations for woodland use and management.

This soil has poor potential for most urban uses. Flooding is a severe limitation for dwellings, septic tank absorption fields, and small commercial buildings. This limitation is difficult to overcome if flood-control structures are not constructed. Low strength and flooding are moderate limitations for local roads and streets. Proper engineering design generally can overcome the low strength problems. Capability unit IIw-1; woodland suitability group 2o4; pasture and hayland group 2A.

27—Oktibbeha silty clay loam, 3 to 8 percent slopes, eroded. This soil is moderately deep, moderately well drained, and gently sloping. It is on hilltops and hillsides in areas of the Blackland Prairies and Coastal Plains. Erosion has removed most of the topsoil; a few shallow rills have formed. The areas are 5 to 200 acres in size.

Typically, the surface layer is dark grayish brown and yellowish red silty clay loam about 4 inches thick. The upper part of the subsoil is red clay; it extends to a depth of about 31 inches. The lower part of the subsoil is mottled gray and red clay; it extends to a depth of about 36 inches. The underlying material is light olive brown mottled clay; it extends to a depth of about 43 inches. Below that there is soft, rippable chalk.

This soil is low in natural fertility and in organic matter content. The surface layer and subsoil range from very strongly acid to slightly acid, except where the surface layer has been limed. The underlying material ranges from neutral to moderately alkaline, and it generally is calcareous. Permeability is very slow, and the available water capacity is medium. When dry, these soils shrink and crack; when wet, they expand and the cracks seal. Tilth is difficult to maintain because of the clayey texture. Crops respond well to fertilizer.

Included with this soil in mapping are a few areas of Oktibbeha soils that have a surface layer of silt loam and a few small areas of Kipling, Millwood, and Sumter soils.

Some of this map unit is in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has poor potential for cultivated crops. Runoff is medium to rapid, and the hazard of erosion is very severe. If contour cultivation, terracing of long slopes, and good management are used, clean tilled crops that leave large amounts of residue can be grown in rotation with pasture and hay. Adapted crops include grain sorghum and small grains. This soil has fair potential for pasture and hay, which are the main uses of the soil. Adapted pasture plants include bahiagrass, hybrid bermudagrass, tall fescue, and white clover. The main limitation is poor trafficability in wet seasons. Limited grazing in winter and spring can help to overcome this limitation.

This soil has fair potential for loblolly pine. The clayey texture limits the use of equipment in managing and harvesting trees when the soil is wet. Using special equipment and planting and harvesting during the drier seasons can help to overcome this limitation.

This soil has poor potential for most urban uses. The very slow permeability is a severe limitation for septic tank absorption fields. This limitation is very difficult to overcome. The high shrink-swell potential and low strength of the soil when it is wet are severe limitations for dwellings, small commercial buildings, and roads and streets. The underlying chalk is a moderate limitation in excavating. The clayey surface layer, when wet, severely limits foot traffic in lawns and gardens. Proper engineering design can help overcome this limitation. Capability unit IVe-2; woodland suitability group 3c8; pasture and hayland group 7A.

28—Oktibbeha clay, 8 to 12 percent slopes, eroded. This soil is moderately deep, moderately well drained, and moderately sloping. It is on hillsides in areas of the Blackland Prairies and Coastal Plains. The areas are about 5 to 100 acres or more in size.

Typically, the surface layer is dark grayish brown and yellowish red clay about 4 inches thick. The upper part of the subsoil is red clay; it extends to a depth of about 31 inches. The lower part of the subsoil is mottled gray and red clay; it extends to a depth of about 36 inches. The underlying material is mottled, olive brown, marly clay; it extends to a depth of 43 inches. Soft, rippable chalk is below the marly clay.

This soil is low in natural fertility and in organic matter content. The surface layer and subsoil range from very strongly acid to slightly acid, except where the surface layer has been limed. The underlying material ranges from neutral to moderately alkaline, and it generally is calcareous. Permeability is very slow, and the available water capacity is medium. When dry, these soils shrink and crack, and when wet, they expand and the cracks seal. Tilth is difficult to maintain because of the clayey texture. Crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Oktibbeha soils that have a surface layer of silt loam and a few small areas of Kipling, Millwood, and Sumter soils.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps and are marked with craters. There are unexploded munitions in these areas.

This soil is not suited to cultivated crops. Runoff is rapid, and the hazard of erosion is very severe. This soil has fair potential for pasture, which is the main use of the soil. Adapted pasture plants include bahiagrass, bermudagrass, tall fescue, white clover, annual lespedeza, and sericea lespedeza. The main limitation is poor trafficability in the wetter seasons. Limited grazing in winter and spring can help to overcome this limitation.

This soil has fair potential for loblolly pine. The clayey texture limits the use of equipment in managing and harvesting trees when the soil is wet. Using special equipment and planting and harvesting during the drier seasons can help to overcome this limitation.

This soil has poor potential for most urban uses. The very slow permeability is a severe limitation for septic tank absorption fields; this limitation is very difficult to overcome. The high shrink-swell potential and low strength of the soil are severe limitations for dwellings, small commercial buildings, and roads and streets. The underlying chalk is a moderate limitation in excavating. The clayey surface layer, when wet, severely limits foot traffic in lawns and gardens. Proper engineering design can help to partially overcome these limitations. Capability unit VIe-1; woodland suitability group 3c8; pasture and hayland group 7A.

29—Oktibbeha-Saffell association, rolling. This association consists of moderately deep and deep, moderately well drained and well drained soils in a regular repeating pattern on rolling hilltops and hillsides. Saffell soils generally are on the hilltops and Oktibbeha soils are on the middle to lower hillsides. The lower part of the subsoil of the Oktibbeha soils formed in residuum of calcareous chalk and marl. The upper part of the Oktibbeha soils formed in acid Coastal Plains sediment. The Saffell soils formed in acid Coastal Plains sediment that was high in gravel content. Slopes range from 8 to 20 percent. The areas are 100 to 500 acres in size.

The moderately well drained Oktibbeha soils make up about 55 percent of this association. Typically, their surface layer is dark grayish brown and yellowish red clay about 4 inches thick. The upper part of the subsoil is red clay; it extends to a depth of about 31 inches. The lower part of the subsoil is gray and red mottled clay; it extends to a depth of about 36 inches. The underlying material is olive brown mottled marly clay; it extends to a depth of about 43 inches. Soft, rippable chalk is at a depth below 43 inches.

Oktibbeha soils have very slow permeability, and their available water capacity is medium. Natural fertility and organic matter content are low. The surface layer and subsoil range from very strongly acid to slightly acid, except where the surface layer has been limed. The underlying material ranges from neutral to moderately alkaline and generally is calcareous.

The well drained, deep, gravelly Saffell soils make up about 30 percent of this association. Typically, their surface layer is brown gravelly fine sandy loam about 6 inches thick. The subsoil is a yellowish red very gravelly sandy clay loam that extends to a depth of about 48 inches. The underlying material is strong brown very gravelly sandy loam that extends to a depth of 72 inches or more.

Saffell soils have moderate permeability, and their available water capacity is low. Natural fertility and organic matter content are low. The Saffell soils are strongly acid or very strongly acid throughout, except where the surface layer has been limed.

Included in mapping are a few small areas of Sacul soils and a few small areas where the soils have slopes of less than 8 percent. Areas of soft sandstone rock where this association joins the flood plain of Hickory Creek are also included.

This association is used mainly as woodland. The Oktibbeha soils have fair potential for loblolly pine. The clayey texture limits the use of equipment in managing and harvesting trees when the soil is wet. Saffell soils have fair potential for shortleaf pine and loblolly pine. Because the available water capacity is low, the seedling mortality is moderate. A very severe erosion hazard is the result of forestry practices that leave the soil bare. On the steeper slopes, the limitations for equipment use are moderate.

This association has poor potential for cultivated crops and poor to fair potential for native pasture and tall fescue. Adapted native pasture plants are big bluestem, little bluestem, and indiangrass. Slope severely restricts the use of equipment. Runoff is rapid, and the hazard of erosion is very severe. Pasture crops on these soils respond well to fertilizer.

This association has poor potential for urban uses. Very slow permeability and steep slopes are severe limitations in using the Oktibbeha soils as septic tank absorption fields. High shrink-swell potential and low strength are severe limitations for dwellings, small commercial buildings, roads, and streets. Proper engineering design generally can help to overcome these limitations. Steep slopes and moderate permeability are severe limitations in using the Saffell soils as septic tank absorption fields. The steep slopes are also severe limitations for dwellings, small commercial buildings, roads, and streets. Proper engineering design generally can overcome these limitations.

Oktibbeha soil in capability unit VIIe-1; woodland suitability group 3c8; pasture and hayland group 7A. Saffell soil in capability unit VIe-3; woodland suitability group 4f2; pasture and hayland group 8G.

30—Ora fine sandy loam, 3 to 8 percent slopes. This soil is deep, moderately well drained, and gently sloping. It is on ridgetops and side slopes of the Coastal Plains. The areas are 5 to 100 acres in size.

Typically, the surface layer is brown fine sandy loam about 8 inches thick. The upper part of the subsoil is yellowish red clay loam or loam; it extends to a depth of about 28 inches. The middle part is a mottled, yellowish red fragipan; it extends to a depth of about 45 inches. The lower part is a mottled, yellowish brown fragipan; it extends to a depth of 72 inches or more.

Included with this soil in mapping are a few small areas of Savannah, Sacul, and Smithdale soils. Also included are small areas that have slopes of less than 3 percent.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is medium. Tilth is easy to maintain, and crops respond well to fertilizer.

This soil has fair potential for cultivated crops. The main crops are small grains, soybeans, and grain sorghum. This soil has good potential for vegetable crops (fig. 6). Runoff is medium to rapid, and erosion is a severe hazard. The fragipan restricts root and water movement. Minimum tillage, contour farming, and the use of cover crops, including grasses and legumes in the cropping system, are management practices that help reduce runoff and control erosion. This soil has fair potential for pasture and hay. The adapted pasture plants include Pensacola bahiagrass, bermudagrass, crimson clover, and tall fescue.

This soil has good potential for loblolly and shortleaf pine. Woodland is the main use. There are no significant limitations to woodland use and management.

This soil has good potential for most urban uses. Moderately slow permeability is a severe limitation for septic tank absorption fields. Increasing the size of the absorption field can overcome this limitation. There are no significant limitations for dwellings. Low strength is a moderate limitation for small commercial buildings and roads and streets. Proper engineering design can overcome this limitation. Capability unit IIIe-1; woodland suitability group 3o7; pasture and hayland group 8A.

31—Ouachita silt loam, occasionally flooded. This soil is deep, well drained, and level. It is on natural levees of streams that drain the Ouachita Mountains and the Coastal Plains. Slopes are 0 to 1 percent. The areas are 15 to 100 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is dark yellowish brown silt loam; it extends to a depth of about 19 inches. The upper part of the subsoil is brown silt loam; it extends to a depth of about 34 inches. The lower part is mottled, dark yellowish brown and yellowish brown silt loam; it extends to a depth of about 58 inches. The underlying material is yellowish brown silt loam; it extends to a depth of 72 inches or more.

This soil is high in natural fertility and medium in organic matter content. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is high. This soil usually is flooded about once every 2 years. Floods usually occur between December and May, and they last about 1 to 3 days. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Sardis and Guyton soils.

This soil has good potential for growing cultivated crops, which is the main use. Soybeans, cotton, grain sorghum, and small grains are the main cultivated crops. Runoff is slow, and sheet erosion is a slight hazard. Occasional flooding is the main limitation for cultivated crops. If good management is used, clean tilled crops that leave a large amount of residue can be grown yearly. This soil has good potential for pasture and hay. Adapted pasture plants include tall fescue, alfalfa, white clover, bermudagrass, and Pensacola bahiagrass.

This soil has good potential for loblolly pine, sweetgum, yellow-poplar, and eastern cottonwood. When the soil is wet, low strength is a moderate limitation for equipment use. Using special equipment or harvesting and planting during drier seasons can overcome this limitation.

This soil has poor potential for most urban uses. Slow percolation and flooding are severe limitations for septic tank filter fields. Flooding is a severe limitation for dwellings, small commercial buildings, and roads and streets. These limitations are difficult to overcome if flood-control structures are not constructed. Capability unit IIw-1; woodland suitability group 1w8; pasture and hayland group 2A.

32—Perry clay, occasionally flooded. This soil is deep, poorly drained, and level. It is on flood plains of the Red River. Slopes are 0 to 1 percent. The areas are about 15 to 200 acres in size.

Typically, the surface layer is dark gray clay about 7 inches thick. The upper part of the subsoil is dark gray mottled clay; it extends to a depth of about 35 inches. The lower part of the subsoil and the underlying material are dark reddish brown and reddish brown, mottled clay; the underlying material extends to a depth of 72 inches or more.

This soil is high in natural fertility and in organic matter content. The surface layer and upper part of the subsoil are slightly acid to strongly acid except where the surface layer has been limed. The lower part of the subsoil and the underlying material are neutral to moderately alkaline, and they generally are calcareous. Permeability is very slow, and the available water capacity is high. When dry, this soil shrinks and cracks, and when wet, the soil expands and the cracks seal. The water table is seasonally high; it is within 12 inches of the surface in winter and spring. This soil is flooded about once every 2 years. Flooding usually occurs from December to May for periods of about 1 to 7 days. Because of the clayey texture, tilth is difficult to maintain. Crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Desha and Portland soils. Also included are a few marsh areas.

This soil has good potential for rice, and fair potential for other row crops and small grains. The main crops are soybeans and grain sorghum. Runoff is very slow, and sheet erosion is a slight hazard. Occasional flooding and wetness are the main limitations. Because of the clayey surface layer, this soil can only be tilled within a narrow range of moisture content. Farming commonly has to be delayed for several days after a rain, and the surface needs to be drained. Flood control projects and surface drainage can overcome most limitations. This soil has fair potential for pasture, which is the main use. Adapted pasture plants include bahiagrass, hybrid bermudagrass, tall fescue, and white clover. During the wet winter and spring months, livestock traffic severely damages pastures. The clayey textures and high water table restrict access for supplemental grazing. Flood control projects and surface drainage help to partially overcome these limitations.

This soil has good potential for sweetgum and water oak and fair potential for eastern cottonwood and pecan. Wetness during late winter and early spring severely restricts the use of equipment in managing and harvesting the tree crop. Special equipment and logging during the dry seasons can overcome this wetness problem.

This soil has a poor potential for most urban uses. The very slow permeability, wetness, and flooding are severe limitations for septic tank absorption fields. The wetness, flooding, high shrink-swell potential, and low strength of the soils are severe limitations for dwellings, small commercial buildings, and roads and streets. When the soil is wet, the clayey surface texture and the high water table are severe limitations for foot trafficability in lawns and gardens. Some of the limitations for urban uses can be partially overcome by flood control projects, drainage systems, and proper engineering design. Capability unit IVw-2; woodland suitability group 2w6; pasture and hayland group 1A.

33—**Portland clay, occasionally flooded.** This soil is deep, somewhat poorly drained, and level. It is on flood plains of the Red River. Slopes are 0 to 1 percent. The areas are about 10 to 300 acres in size.

Typically, the surface layer is dark grayish brown clay about 7 inches thick. The subsurface layer is dark grayish brown clay; it extends to a depth of about 15 inches. The subsoil is reddish brown, mottled clay; it extends to a depth of 72 inches or more.

This soil has good potential for cultivated crops. Adapted crops include rice, soybeans, grain sorghum, and cotton. Runoff is very slow, and sheet erosion is a slight hazard. Occasional flooding and wetness are the main limitations. Because the surface layer is clayey, this soil can be tilled only within a narrow moisture range. Farming commonly has to be delayed for several days after a rain, and surface drains are needed. Flood-control structures and drainage systems can overcome most limitations. This soil has good potential for pasture, which is the main use. Adapted pasture plants include bahiagrass, hybrid bermudagrass, tall fescue, and white clover. In the wet winter and spring months, livestock traffic severely damages pastures. The clayey texture and high water table restrict access for supplemental grazing. Occasional flooding is a hazard to livestock. Flood control projects and surface drainage help to partly overcome these limitations.

Included with this soil in mapping are a few small areas of Perry and Desha soils and a few small areas of marsh.

This soil is high in natural fertility and in organic matter content. The surface layer is strongly acid or very strongly acid, except where the surface layer has been limed. The subsoil ranges from slightly acid to moderately alkaline. Permeability is very slow, and the available water capacity is high. When dry this soil shrinks and cracks, and when wet the soil expands, and the cracks seal. The water table is seasonally high and within 12 inches of the surface during the winter and early in spring. This soil is flooded about once every 2 years. Flooding usually occurs from December to May for periods of about 1 to 5 days. Because of the clayey texture, tilth is difficult to maintain. Crops respond well to fertilizer.

This soil has a good potential for green ash, eastern cottonwood, and sweetgum. During wet seasons, the clayey texture has low strength, which severely restricts the use of equipment in managing and harvesting the tree crop. This low strength generally is overcome by logging during the dry season.

This soil has poor potential for most urban uses. The slow permeability, flooding, and wetness are severe limitations for septic tank absoption fields. These limitations are difficult to overcome. The wetness, flooding hazard, high shrink-swell potential, and low strength of this soil are severe limitations for dwellings, small commercial buildings, and streets and roads. Some of these limitations can be partially overcome by flood control projects, drainage measures, and proper engineering design. Capability unit IVw-2; woodland suitability group 2w6; pasture and hayland group 1A.

34—**Ruston fine sandy loam, 1 to 3 percent slopes.** This soil is deep, well drained, and nearly level. It is on ridgetops and stream terraces of the Coastal Plains. The areas are 5 to 80 acres in size.

Typically, the surface layer is yellowish brown fine sandy loam about 5 inches thick. The subsurface layer is dark brown fine sandy loam; it extends to a depth of about 9 inches. The upper part of the subsoil is yellowish red sandy clay loam; it extends to a depth of about 42 inches. The middle part of the subsoil is yellowish red fine sandy loam that has streaks of light yellowish brown; it extends to a depth of about 48 inches. The lower part of the subsoil is yellowish red, mottled sandy clay loam; it extends to a depth of about 87 inches. The underlying material is strong brown fine sandy loam; it extends to a depth of 98 inches or more.

This soil is moderate to low in natural fertility and organic matter content. The surface layer is slightly acid to strongly acid, except where limed. The subsoil and underlying material are medium acid to very strongly acid. Permeability is moderate, and the available water capacity is high. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Harleston, Ora, Bowie, and Sacul soils. Also included are small areas that have slopes exceeding 3 percent and a few small eroded areas.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps. There are unexploded munitions in these areas, which are marked with craters.

This soil has good potential for cultivated crops, which are the main use. The main crops are soybeans, cotton, grain sorghum, small grains, fruit, and vegetable crops. Runoff is medium, and erosion is a moderate hazard. Minimum tillage, contour farming, and the use of cover crops, including grasses and legumes in the cropping system, are management practices that help reduce runoff and control erosion. This soil has good potential for pasture and hay. Adapted pasture plants include bermudagrass, Pensacola bahiagrass, tall fescue, crimson clover, annual lespedeza, and sericea lespedeza.

This soil has good potential for loblolly pine. There are no significant limitations for woodland use or management.

This soil has good potential for most urban uses. There are no significant limitations for septic tank absorption fields, dwellings, small commercial buildings, and roads and streets. Capability unit IIe-1; woodland suitability group 3o1; pasture and hayland group 8A.

35—Sacul fine sandy loam, 3 to 8 percent slopes. This soil is deep, moderately well drained, and gently sloping. It is on hilltops and hillsides of the Coastal Plains. The areas are 5 to 100 acres in size.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The upper part of the subsoil is yellowish red and red clay; it extends to a depth of about 22 inches. The middle part of the subsoil is mottled gray, red, and yellowish brown silty clay and silty clay loam; it extends to a depth of about 51 inches. The lower part of the subsoil is mottled gray and yellowish brown silty clay; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is slow, and the available water capacity is high. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Kirvin, Ora, and Smithdale soils and soils similar to this Sacul soil except that the subsoil is yellowish brown. Also included are a few small areas of eroded soils.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil has poor potential for cultivated crops. Adapted crops include small grains and grain sorghum. Runoff is medium, and erosion is a very severe hazard. If contour cultivation, terracing of long slopes, and good management are used, clean tilled crops that leave a large amount of residue can be grown occasionally in a cropping system that includes grasses and legumes most of the time. This soil has fair potential for pasture. Adapted pasture plants include hybrid bermudagrass, Pensacola bahiagrass, tall fescue, crimson clover, and sericea lespedeza.

This soil has fair potential for loblolly pine (fig. 7). Its main use is loblolly pine and shortleaf pine forest. If the surface layer has been disturbed, erosion on logging trails and in harvested areas is the main problem in woodland management. Logging trails on the contour and quick reforestation of harvested areas help reduce the erosion hazard.

This soil has poor potential for most urban uses. The slow permeability is a severe limitation for septic tank absorption fields and is difficult to overcome. Low strength and the shrink-swell potential impose severe limitations for dwellings, small commercial buildings, and roads and streets. Proper engineering design can help overcome these limitations. Capability unit IVe-2; woodland suitability group 3c2; pasture and hayland group 8C.

36—Sacul fine sandy loam, 8 to 12 percent slopes. This soil is deep, moderately well drained, and moderately sloping. It is on hilltops and hillsides of the Coastal Plains. The areas are 10 to 80 acres in size.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The upper part of the subsoil is yellowish red and red clay; it extends to a depth of about 22 inches. The middle part of the subsoil is mottled gray, red, and yellowish brown silty clay and silty clay loam; it extends to a depth of about 51 inches. The lower part of the subsoil is mottled gray and yellowish brown silty clay; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is slow, and the available water capacity is high. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Kirvin and Briley soils. Also included are a few small eroded areas and a few small areas that have slopes of more than 12 percent.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This soil is generally not suited to cultivated crops. Runoff is rapid, and erosion is a very severe hazard. This soil has fair potential for pasture. Adapted pasture plants include hybrid bermudagrass, Pensacola bahiagrass, crimson clover, annual lespedeza, and sericea lespedeza.

This soil has fair potential for loblolly pine. Its main use is loblolly pine and shortleaf pine forest. If the surface layer has been disturbed, erosion on logging trails and in harvested areas is the main limitation in woodland management. Logging trails on the contour and quick reforesting of harvested areas reduce the erosion hazard.

This soil has poor potential for most urban uses. The slow permeability is a severe limitation to use of the soils as septic tank absorption fields. This limitation is difficult to overcome. Low strength, high shrink-swell potential, and steep slopes are severe limitations for dwellings, small commercial buildings, and roads and streets. Proper engineering design can help to overcome these limitations. Capability unit VIe-1; woodland suitability group 3c2; pasture and hayland group 8C.

37—Sacul-Kirvin association, rolling. This association consists of deep, moderately well drained and well drained soils in a regular repeating pattern on rolling hills of the Coastal Plains. Sacul soils are on hillsides and narrow hilltops. Kirvin soils are on a landscape similar to that of Sacul soils. The Sacul and Kirvin soils formed in loamy and clayey, marine sediment. Slopes are 8 to 20 percent. Mapped areas are more than 100 acres in size.

The moderately well drained, deep, Sacul soils make up about 45 percent of this association. Typically, their surface layer is brown fine sandy loam about 5 inches thick. The upper part of the subsoil is yellowish red and red clay; it extends to a depth of about 22 inches. The middle part of the subsoil is mottled gray, red, and yellowish brown silty clay and silty clay loam; it extends to a depth of about 51 inches. The lower part of the subsoil is mottled gray and yellowish brown silty clay; it extends to a depth of about 72 inches or more.

Sacul soils are low in natural fertility and in organic matter content. They have slow permeability and high available water capacity. These soils are strongly acid or very strongly acid throughout, except where the surface layer has been limed.

The well drained, deep, Kirvin soils make up about 30 percent of this association. Typically, their surface layer is brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red clay loam that extends to a depth of about 10 inches. The middle part of the subsoil is red clay extending to a depth of about 30 inches. The lower part of the subsoil is red mottled sandy clay or clay that extends to a depth of about 56 inches. The underlying material is stratified clay loam and sandstone, mottled in shades of red and brown; it extends to a depth of 72 inches or more.

Kirvin soils are low in natural fertility and in organic matter content. They have moderately slow permeability and medium available water capacity. These soils are strongly acid to extremely acid throughout, except where the surface layer has been limed.

Included in mapping are a few areas of Bowie, Smithdale, and Ora soils.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps. There may be unexploded munitions in these areas, which are marked with craters.

This association is used mainly as woodland. The Sacul and Kirvin soils have fair potential for loblolly pine and shortleaf pine. If the surface layer has been disturbed, erosion of logging trails and harvested areas is a moderate hazard. Logging trails on the contour and quick reforesting of harvested areas reduce the erosion hazard.

These soils have poor potential for most urban uses. The slow permeability and steep slopes are severe limitations for septic tank absorption fields. These limitations are difficult to overcome. Low strength, high shrink-swell potential, and steep slopes are moderate to severe limitations for dwellings, small commercial buildings, and roads and streets. Sacul soil in capability unit VIe-5; woodland suitability group 3c2; pasture and hayland group 8C. Kirvin soil in capability unit VIe-5; woodland suitability group 3o1; pasture and hayland group 7A.

38—Saffell gravelly fine sandy loam, 3 to 8 percent slopes. This soil is deep, well drained, and gently sloping. It is on narrow hilltops and hillsides of the Coastal Plains. The areas are 10 to 100 acres in size.

Typically, the surface layer is brown gravelly fine sandy loam about 6 inches thick. The subsoil is yellowish red very gravelly sandy clay loam; it extends to a depth of about 48 inches. The underlying material is strong brown very gravelly sandy loam; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and the available water capacity is low. Tilth is difficult to maintain because of the high gravel content. Crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Sacul, Smithdale, and Millwood soils. Also included are small areas of soils similar to Saffell soils except that they have a higher calcium content.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps, and they are marked with craters. There may be unexploded munitions in the areas.

This soil has poor potential for most cultivated crops. It has good potential for fruit crops such as peaches. Peaches and small grains are the main crops. Because of the high gravel content, this soil is difficult to till. Droughtiness is a moderate to severe limitation for most cultivated crops. Runoff is medium, and erosion is a moderate hazard. If good management practices are used, such as minimum tillage, contour cultivation, and terracing, clean tilled crops that leave large amounts of residue can be grown yearly. As slope gradient increases, more intensive management is needed. This soil has fair potential for pasture and hay, which are the main uses. Adapted pasture plants include bermudagrass, Pensacola bahiagrass, crimson clover, and sericea lespedeza. Droughtiness is the main limitation for forage production.

This soil has fair potential for loblolly pine, shortleaf pine, and eastern redcedar. There are no significant limitations for woodland use and management.

This soil has good potential for most urban uses. There are no significant limitations for septic tank absorption fields, dwellings, roads, and streets. This soil has moderate limitations for small commercial buildings because of the slope. Proper engineering design can overcome this limitation. This soil has a moderate limitation for lawns and gardens because of the high gravel content. This soil is an important source of material for gravel. Capability unit IIIe-3; woodland suitability group 4f2; pasture and hayland group 8G.

39—Saffell gravelly fine sandy loam, 8 to 12 percent slopes. This soil is deep, well drained, and moderately sloping. It is on hillsides of the Coastal Plains. The areas are 5 to 100 acres in size.

Typically, the surface layer is brown gravelly fine sandy loam about 6 inches thick. The subsoil is yellowish red very gravelly sandy clay loam; it extends to a depth of about 48 inches. The underlying material is strong brown very gravelly sandy loam; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and the available water capacity is low. Because the gravel content is high, tilth is difficult to maintain. Crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Sacul and Oktibbeha soils, and soils that are similar to Saffell soils except that they have high calcium content.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps, and they are marked with craters. There may be unexploded munitions in these areas.

This soil has poor potential for most cultivated crops. Fruit crops such as peaches have a good potential. Peaches and small grains are the main crops. Because of high gravel content this soil is difficult to till. Droughtiness is a moderate to severe limitation for most cultivated crops. Runoff is medium, and erosion is a very severe hazard. If good management practices are used, such as minimum tillage, contour cultivation, and terracing, clean tilled crops that leave large amounts of residue can be grown in rotation. This soil has fair potential for pasture and hay, which are the main uses. The best suited pasture plants are bermudagrass, crimson clover, Pensacola bahiagrass, and sericea lespedeza. Droughtiness is the main limitation for forage production.

This soil has fair potential for loblolly pine, shortleaf pine, and eastern redcedar. There are no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. Because of slope it has moderate limitations for septic tank absorption fields, dwellings, roads, and streets. Because of slope this soil has severe limitations for small commercial buildings. Proper engineering design can help to overcome these limitations. This soil is an important source of material for gravel. It has moderate limitations for lawns and gardens because the gravel content is high. Capability unit IVe-3; woodland suitability group 4f2; pasture and hayland group 8G.

40—Sardis silt loam, occasionally flooded. This soil is deep, somewhat poorly drained, and nearly level. It is on flood plains of the Coastal Plains. Slopes are 0 to 3 percent. The areas are 15 to over 50 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The upper part of the subsoil is brown silt loam; it extends to a depth of about 12 inches. The lower part of the subsoil is brown or yellowish brown, mottled silt loam; it extends to a depth of about 56 inches. The underlying material is gray, mottled loam; it extends to a depth of 72 inches or more.

This soil is medium to high in natural fertility and in organic matter content. Reaction ranges from medium acid to very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. The water table is seasonally high and within 12 inches of the surface late in winter and early in spring. This soil usually is flooded about once every 2 years. Flooding usually occurs from January through May for a period of about 1 to 3 days. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Ouachita and Savannah soils. Also included are small areas of soils that are similar to this Sardis soil except that the surface layer is thick and dark.

This soil has fair to good potential for growing cultivated crops, which is the main use. The main cultivated crops are soybeans and grain sorghum. Other suitable crops are small grains and cotton. Runoff is slow, and erosion is a moderate hazard. If good management practices are used, clean tilled crops that leave large amounts of residue can be grown yearly. Minimum tillage helps to reduce erosion and maintain organic matter content. Occasional flooding and wetness are the main limitations. Flood control projects and surface drainage can overcome these limitations. This soil has good potential for pasture and hay. Adapted pasture plants include tall fescue, alfalfa, white clover, bermudagrass, and Pensacola bahiagrass.

This soil has good potential for loblolly pine and sweetgum. When the soil is wet, poor trafficability is a moderate limitation for equipment use. Wetness is a moderate limitation for seedling survival. Using special equipment or harvesting and planting during the drier seasons generally can overcome these limitations.

This soil has poor potential for most urban uses. Slow percolation, wetness, and flooding are severe limitations for septic tank filter fields. Flooding and wetness are also severe limitations for dwellings, small commercial buildings, and roads and streets. These limitations are difficult to overcome unless flood-control structures and drainage systems are constructed. Capability unit IIw-3; woodland suitability group 1w8; pasture and hayland group 2B.

41—Savannah fine sandy loam, 1 to 3 percent slopes. This soil is deep, moderately well drained, and nearly level. It is on broad ridgetops and hillsides of the Coastal Plains. The areas are about 5 to 100 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer extends to a depth of about 15 inches. In the upper 6 inches it is brown fine sandy loam, and in the lower 6 inches it is brown and yellowish brown loam. The upper part of the subsoil is yellowish brown clay loam; it extends to a depth of about 25 inches. The lower part of the subsoil is a mottled red, yellowish brown, and gray sandy clay loam and fine sandy loam fragipan; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate in the upper part of the solum and moderately slow in the fragipan. A seasonal water table occurs within 18 inches of the surface late in winter and early in spring. The available water capacity is medium. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Ora and Bowie soils, and soils similar to this Savannah soil except they are somewhat poorly drained. Also included are a few small areas that have slopes greater than 3 percent.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps, and they are marked with craters. There may be unexploded munitions in these areas.

This soil has fair potential for cultivated crops. The main cultivated crops are soybeans, grain sorghum, and small grains. Runoff is medium, and erosion is a moderate hazard. The fragipan restricts root growth and water movement. If good management practices such as contour farming, minimum tillage, and terracing are used, clean tilled crops that leave large amounts of residue can be grown yearly. This soil has good potential for pasture and hay, which are the main uses. Adapted pasture plants include bermudagrass, Pensacola bahiagrass, tall fescue, white clover, crimson clover, and annual lespedeza.

This soil has fair potential for loblolly pine. There are no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. Moderately slow permeability is a severe limitation for septic tank absorption fields. Increasing the size of the absorption field can partially overcome this limitation. Wetness is a moderate limitation for dwellings and small commercial buildings. Installing surface drainage can generally overcome this limitation. Low strength is a moderate limitation for roads and streets. Proper engineering design generally can overcome this limitation. Capability unit IIe-1; woodland suitability group 3o7; pasture and hayland group 8A.

42—Savannah fine sandy loam, 3 to 8 percent slopes. This soil is deep, moderately well drained, and gently sloping. It is on ridgetops and hillsides of the Coastal Plains. The areas are 3 to 120 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer extends to a depth of about 15 inches. In the upper 6 inches it is brown fine sandy loam, and in the lower 6 inches it is brown and yellowish brown loam. The upper part of the subsoil is yellowish brown clay loam; it extends to a depth of about 25 inches. The lower part of the subsoil is a mottled red, yellowish brown, and gray sandy clay loam and fine sandy loam fragipan; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate in the upper part of the surface layer, and moderately slow in the fragipan. A seasonal water table occurs within 18 inches of the surface late in winter and early in spring. The available water capacity is medium. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping areas are small areas of Ora, Bowie, and Sacul soils. Also included are small areas that have slope of less than 3 percent or greater than 8 percent and small eroded spots.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps, and the areas are marked with craters. There may be unexploded munitions in these areas.

This soil has fair potential for cultivated crops. The main crops are small grains, grain sorghum, and soybeans. Runoff is medium to rapid, and erosion is a severe hazard. The fragipan restricts root growth and water movement. Such practices as minimum tillage, contour farming, and the use of cover crops, including grasses and legumes, help reduce runoff and control erosion. This soil has good potential for pasture and hay, which are the main uses. The main adapted pasture plants include bermudagrass, Pensacola bahiagrass, tall fescue, crimson clover, annual lespedeza, and sericea lespedeza.

This soil has good potential for loblolly pine. There are no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. Moderately slow permeability is a severe limitation for septic tank absorption fields. This limitation can be partially overcome by increasing the size of the absorption field. Seasonal wetness is a moderate limitation for dwellings and small commercial buildings. This limitation generally can be overcome by installing a drainage system. Low strength is a moderate limitation for roads and streets. This limitation can usually be overcome with proper engineering design. Capability unit IIIe-1; woodland suitability group 3o7; pasture and hayland group 8A.

43—**Sawyer loam, 1 to 3 percent slopes.** This soil is deep, moderately well drained, and nearly level. It is on broad hilltops of the Coastal Plains. The areas are about 15 to 200 acres in size.

Typically, the surface layer is dark grayish brown loam about 6 inches thick. The upper part of the subsoil extends to a depth of about 29 inches; it is yellowish brown silty clay loam and has gray mottles in the lower part. The lower part of the subsoil extends to a depth of 72 inches or more; it is mottled red, gray, and yellowish brown silt loam and silty clay.

This soil is low in natural fertility and in organic matter content. It is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is slow, and the available water capacity is medium. A seasonal water table is within 24 inches of the surface late in winter and early in spring. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Savannah, Mayhew, and Sacul soils. Also included are a few small areas that have slopes greater than 3 percent.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps, and are marked with craters. There may be unexploded munitions in these areas.

This soil has fair potential for cultivated crops. Runoff is slow to medium, and erosion is a moderate hazard. The main cultivated crops are grain sorghum and soybeans. Other suited crops are small grains. If contour cultivation, minimum tillage, and good management are used, clean tilled crops that leave a large amount of residue can be grown yearly. Seasonal wetness is a slight limitation, which can generally be overcome by drainage. This soil has good potential for pasture, which is the main use (fig. 8). Adapted pasture plants include bermudagrass, bahiagrass, tall fescue, and white clover.

This soil has good potential for loblolly pine. Wetness is a moderate limitation to equipment use in managing and harvesting the tree crop. Using special equipment or logging and planting during the drier seasons generally can overcome this limitation.

This soil has poor potential for most urban uses. Slow permeability is a severe limitation for septic tank absorption fields and is difficult to overcome. Low strength and moderate to high shrink-swell potential are severe limitations for dwellings, small commercial buildings, and roads and streets. Proper engineering design generally can overcome these limitations. Capability unit IIe-1; woodland suitability group 2w8; pasture and hayland group 8C.

44—**Sawyer loam, 3 to 8 percent slopes.** This soil is deep, moderately well drained, and gently sloping. It is on hillsides and hilltops of the Coastal Plains. The areas are 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown loam about 6 inches thick. The upper part of the subsoil extends to a depth of about 29 inches; it is yellowish brown silty clay loam and has gray mottles in the lower part. The lower part of the subsoil extends to a depth of 72 inches or more; it is mottled red, gray, and yellowish brown silt loam and silty clay.

This soil is low in natural fertility and in organic matter content. It is very strongly acid or strongly acid throughout, except where the surface layer has been been limed. Permeability is slow, and the available water capacity is medium. A seasonal, perched water table occurs within 24 inches of the surface late in winter and early in spring. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Savannah, Sacul, and Mayhew soils. Also included are a few eroded areas and a few small areas that have slopes of less than 3 percent.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps, and are marked with craters. There may be unexploded munitions in these areas.

This soil has fair potential for cultivated crops. Runoff is medium, and erosion is a severe hazard. The main cultivated crop is grain sorghum. Other suited crops are small grains. Minimum tillage, contour cultivation, and terracing of long slopes reduce the erosion hazard. Clean tilled crops that leave large amounts of residue reduce the erosion hazard and help to maintain tilth. This soil has fair to good potential for pasture, which is the main use. Adapted pasture plants include bahiagrass, bermudagrass, tall fescue, and white clover.

This soil has good potential for loblolly pine. Wetness is a moderate limitation to equipment use in managing and harvesting the tree crop. Logging in the dry seasons helps to overcome this limitation.

This soil has poor potential for most urban uses. The slow permeability is a severe limitation for septic tank absorption fields and is difficult to overcome. Low strength and moderate to high shrink-swell potential are severe limitations for dwellings, small commercial buildings, and roads and streets. Proper engineering design can help to overcome these limitations. Capability unit IIIe-1; woodland suitability group 2w8; pasture and hayland group 8C.

45—**Smithdale fine sandy loam, 3 to 8 percent slopes.** This soil is deep, well drained, and gently sloping. It is on ridgetops and hillsides of the Coastal Plains. The areas are 2 to 150 acres in size.

Typically, the surface layer is brown fine sandy loam about 7 inches thick. The subsurface layer is yellowish brown loam; it extends to a depth of about 13 inches. The subsoil is yellowish red and red loam; it extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Briley, Harleston, Ora, and Sacul soils. Also included are a few small eroded areas.

This soil has fair potential for cultivated crops and good potential for vegetable crops. The main crops are soybeans, small grains, and grain sorghum. Other crops include corn and vegetable or fruit crops. Runoff is medium to rapid, and erosion is a severe hazard. Minimum tillage, contour farming, and the use of cover crops, including grasses and legumes, help reduce runoff and control erosion. This soil has good potential for pasture and hay, which are the main use. Adapted pasture plants include bermudagrass, Pensacola bahiagrass, tall fescue, crimson clover, and sericea lespedeza.

This soil has good potential for loblolly pine. There are no significant limitations for woodland use and management.

This soil has good potential for most urban uses. There are no significant limitations for septic tank absorption fields, dwellings, roads, and streets. Slope is a moderate limitation for small commercial buildings. This limitation can be easily overcome by modifying the construction design. Capability unit IIIe-1; woodland suitability group 3o1; pasture and hayland group 8A.

46—Smithton fine sandy loam. This soil is deep and poorly drained. It is on level to depressional areas on upland flats and stream terraces of the Coastal Plains. Slopes are 0 to 1 percent. The areas range from 7 to more than 100 acres in size.

Typically, the surface layer is grayish brown fine sandy loam about 7 inches thick. The subsoil is gray mottled loam and clay loam; it extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic matter content. Reaction is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is low to medium. A seasonal water table occurs at the surface late in winter and early in spring. Water often ponds on the surface in wet periods. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Harleston and Guyton soils. Also included are a few areas of Smithton soils that are subject to flooding and a few rounded mounds that are 50 to 100 feet in diameter and from 3 to 5 feet high.

This soil has fair potential for cultivated crops. Adapted crops include grain sorghum and small grains. Wetness is the main limitation; field operations are often delayed several days after a rain. This limitation can partially be overcome by drainage systems. Runoff is slow. This soil has fair potential for pasture and hay. Wetness is the main limitation, which can partially be overcome by drainage systems and deferred grazing during wet periods. Adapted pasture plants include hybrid bermudagrass, tall fescue, and white clover.

This soil has good potential for loblolly pine, cherrybark oak, water oak, and sweetgum. Mixed hardwood and pine forest is the main use of this soil. Wetness is a severe limitation for use of equipment in managing and harvesting trees. This limitation generally can be overcome by using special equipment and harvesting during the dry seasons.

This soil has poor potential for most urban uses. Wetness and slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult to overcome. Wetness and low strength are severe limitations for dwellings, small commercial buildings, and roads and streets. These limitations can be partially overcome by installation of drainage systems and by proper engineering design. Capability unit IIIw-1; woodland suitability group 2w9; pasture and hayland group 8F.

47—Sterlington very fine sandy loam, 0 to 2 percent slopes. This soil is deep, well drained, and nearly level. It is on low terraces and natural levees along present and abandoned channels of the Red River. The areas are 3 to 120 acres in size.

Typically, the surface layer is brown very fine sandy loam about 7 inches thick. The subsurface layer is brown very fine sandy loam and extends to a depth of 15 inches. The upper part of the subsoil is yellowish red silt loam; it extends to a depth of about 45 inches. The lower part of the subsoil is yellowish red loam; it extends to a depth of about 59 inches. The underlying material is yellowish brown fine sand that extends to 72 inches or more.

This soil is high in natural fertility and low in organic matter content. If unlimed, the surface layer is very strongly acid or medium acid in reaction. The subsoil is strongly acid to slightly acid in reaction. The underlying material is strongly acid to moderately alkaline in reaction. Permeability is moderate, and the available water capacity is high. Tilth is easy to maintain, and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Latanier and Oklared soils. Also included are a few narrow, wet swales consisting of soils formed in very fine sand and clay.

This soil has good potential for cultivated crops. Soybeans, cotton, grain sorghum, small grains, and fruit and vegetable crops are the main crops. Runoff is slow to medium, and erosion is a moderate hazard. If contour cultivation and good management are used, clean tilled crops that leave a large amount of residue can be grown yearly. This soil has good potential for pasture and hay, which are the main uses. Adapted pasture plants include alfalfa, bermudagrass, Pensacola bahiagrass, tall fescue, crimson clover, and white clover.

This soil has good potential for hardwoods such as eastern cottonwood. There are no significant limitations for woodland use and management.

This soil has good potential for most urban uses. There are no significant limitations for septic tank absorption fields, dwellings, and small commercial buildings. This soil has a moderate limitation for roads and streets because of low strength. This limitation is easily overcome by proper engineering design. Capability unit IIe-1; woodland suitability group 2o4; pasture and hayland group 2A.

48—**Sumter clay, 3 to 12 percent slopes, eroded.** This soil is moderately deep, well drained, and gently sloping to moderately sloping. It is on hilltops and hillsides of the Blackland Prairies. Erosion has removed most of the topsoil; a few rills have formed. The areas are about 5 to 100 acres in size.

Typically, the surface layer is olive clay about 4 inches thick. The upper part of the subsoil is olive clay; it extends to a depth of about 18 inches. The lower part of the subsoil is pale olive mottled clay; it extends to a depth of about 27 inches. The underlying material is light olive gray soft chalk; it extends to a depth of about 35 inches and overlies hard rippable chalk.

This soil is moderate in natural fertility and in organic matter content. It is moderately alkaline and calcareous throughout. Permeability is slow, and the available water capacity is low. Tilth is difficult to maintain because of the clayey surface layer. Pasture plants respond well to nitrogen and potash but poorly to phosphate.

Included with this soil in mapping are a few small areas of Demopolis, Houston, and Oktibbeha soils. Also included are a few small gullied areas and a few areas where the slopes are greater than 12 percent.

This soil is not suited to cultivated crops. Runoff is rapid, and the hazard of erosion is very severe. Limitations include limited rooting depth, slope, and erosion. If conservation practices such as minimum tillage, contour cultivation, and terraces are used, the less sloping areas of this Sumter soil can be used for clean tilled crops. This soil has fair potential for improved pasture and good potential for native range. Adapted improved pasture plants include hybrid bermudagrass, King Ranch bluestem, tall fescue, and white clover. Adapted native range plants include little bluestem, big bluestem, indiangrass, and switchgrass.

This soil has fair potential for eastern redcedar. If the soil is disturbed by planting and harvesting, erosion is a hazard. Clayey texture is a moderate limitation for equipment use, especially on the steeper slopes when the soil is wet. Low available water capacity causes moderate seedling mortality. These limitations are difficult to overcome.

This soil has poor potential for urban uses. The slow permeability and depth to chalk are severe limitations for septic tank absorption fields. These limitations are difficult to overcome. Low strength and high shrink-swell potential are severe limitations for dwellings, small commercial buildings, and roads and streets. Proper engineering design generally can overcome these limitations. Capability unit VIe-2; woodland suitability group 4c2; pasture and hayland group 17A.

49—**Terouge silty clay, occasionally flooded.** This soil is deep, somewhat poorly drained, and level. It is on flood plains of streams draining the Blackland Prairies. Slopes are 0 to 1 percent. The areas are about 15 to 300 acres in size.

Typically, the surface layer is very dark grayish brown silty clay about 8 inches thick. The next layer is mottled, dark olive gray and very dark gray silty clay; it extends to a depth of about 26 inches. The underlying material is mottled, dark gray silty clay; it extends to a depth of 72 inches or more.

This soil is high in natural fertility and in organic matter content. The soil is neutral to moderately alkaline and calcareous throughout. Permeability is very slow, and the available water capacity is high. When this soil is dry, it shrinks and cracks, and when wet, the soil expands and the cracks seal. The water table is seasonally high and within 12 inches of the surface in winter and spring. This soil is flooded about once every 2 years. Flooding generally occurs from December to May for periods of about 1 to 7 days. Tilth is difficult to maintain because of the clayey texture. Crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Marietta, Tuscumbia, and Una soils. Also included are a few small areas of Terouge soils that have an overwash of fine sandy loam.

Some areas are in a former munitions-impact area, the boundaries of which are shown on the soil maps, and are marked with craters. There may be unexploded munitions in these areas.

This soil has good potential for cultivated crops, which is the main use. The cultivated crops include soybeans, cotton, rice, and grain sorghum. Runoff is slow, and sheet erosion is a slight hazard. Occasional flooding and wetness are the main limitations for cultivated crops. Farming operations commonly have to be delayed for several days after a rain, and surface drains are needed. Because of the clayey surface layer, this soil can only be tilled within a narrow range of moisture content. Flood control structures and drainage improve the potential of this soil for cultivated crops. This soil has good potential for pasture and hay. Adapted pasture plants include tall fescue, alfalfa, crimson clover, white clover, and bermudagrass. During wet periods, livestock traffic severely damages pastures. The clayey texture and high water table restrict supplemental grazing. Occasional flooding is a hazard to livestock. Flood control structures and improved drainage reduce the limitations for pasture and hay.

This soil has fair potential for eastern redcedar. Wetness and low strength severely restrict the use of equipment in managing and harvesting tree crops but can be overcome by harvesting in dry periods.

This soil has poor potential for most urban uses. The very slow permeability and occasional flooding are severe limitations for septic tank filter fields. Wetness, occasional flooding, high shrink-swell potential, and low strength are severe limitations for dwellings, small commercial buildings, and roads and streets. These limitations are difficult or impractical to overcome. Capability unit IIw-2; woodland suitability group 4c2; pasture and hayland group 1A.

50—Trebloc silt loam, 0 to 2 percent slopes. This soil is deep, poorly drained, and level to nearly level. It is on upland flats and shallow swales. The areas are 5 to 100 acres in size.

Typically, the surface layer is a grayish brown silt loam about 7 inches thick. The upper part of the subsoil is a gray mottled silt loam; it extends to a depth of about 32 inches. The middle part of the subsoil is a gray mottled silty clay loam; it extends to a depth of about 42 inches. The lower part of the subsoil is a gray mottled silty clay; it extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. The soil is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is slow, and the available water capacity is high. The water table is seasonally high and within 12 inches of the surface in late winter and early spring. Tilth is easy to maintain and crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Kipling, Mayhew, and Sawyer soils.

This soil has fair potential for cultivated crops. Suited crops include grain sorghum and soybeans. Runoff is slow to very slow, and excess water is a hazard. In many places farming operations are delayed several days after a rain unless drainage systems are installed. The soil has good potential for pasture, which is the main use. Adapted pasture plants include bermudagrass, tall fescue, and white clover. In winter and spring, livestock traffic can severely damage pastures. Wetness and the high water table restrict access to sites for supplemental grazing.

This soil has good potential for loblolly pine, green ash, Shumard oak, and sweetgum. Wetness is a severe limitation for equipment in woodland use and management. This limitation generally is overcome by using special equipment and by planting and harvesting during the drier seasons.

This soil has poor potential for most urban uses. Wetness and slow permeability are severe limitations for septic tank absorption fields and are difficult to overcome. Wetness is a severe limitation for dwellings and small commercial buildings. Wetness and low strength are severe limitations for roads and streets. Wetness is a severe limitation for foot trafficability in lawns and gardens. Drainage and proper engineering design help to overcome these limitations. Capability unit IIIw-1; woodland suitability group 2w9; pasture and hayland group 8F.

51—Tuscumbia clay, occasionally flooded. This soil is deep, poorly drained, and level. It is on flood plains of streams draining the Blackland Prairies. Slopes are 0 to 1 percent. The areas are 5 to 300 acres in size.

Typically, the surface layer is dark grayish brown mottled clay about 8 inches thick. The subsoil is dark gray and gray mottled clay; it extends to 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Reaction ranges from strongly acid through moderately alkaline. Permeability is very slow, and the available water capacity is high. When this soil is dry, it shrinks and cracks, and when wet, the soil expands and cracks seal. The water table is seasonally high and is within 12 inches of the surface in winter and spring. This soil floods about once every 2 years. Flooding usually occurs from December to May for periods of about 1 to 7 days. Tilth is difficult to maintain because of the clayey texture. Crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Marietta, Terouge, and Una soils. Also included are a few small areas of Tuscumbia soils that have an overwash of fine sandy loam.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps, and are marked with craters. There may be unexploded munitions in these areas.

This soil has good potential for cultivated crops, which are the main use. The main cultivated crops include soybeans, cotton (fig. 9), and grain sorghum. Rice is also suited to the soil. Runoff is very slow, and sheet erosion is a slight hazard. Occasional flooding and wetness are the main limitations for cultivated crops. Farming commonly has to be delayed for several days after a rain, and surface drains are needed. Because the clayey surface layer is very sticky and plastic when wet and very hard when dry, tillage is difficult. Most limitations for cultivated crops can be overcome by flood control structures and drainage. This soil has a good potential for pasture and hay. Adapted pasture plants include tall fescue, white clover, and bermudagrass. In wet periods, livestock traffic severely damages pastures. The clayey texture and high water table restrict access for supplemental grazing. Occasional flooding is a hazard to livestock. Flood control structures and drainage reduce the limitations for pasture and hay.

This soil has good potential for eastern cottonwood, green ash, and sweetgum. When the soil is wet, poor trafficability is a severe limitation for the use of equipment in managing and harvesting trees, but this limitation generally is overcome by use of special equipment and harvesting and planting trees during dry periods. Wetness and the clayey surface layer cause severe seedling mortality, and they are difficult to overcome.

This soil has poor potential for most urban uses. The very slow permeability and occasional flooding are severe limitations for septic tank absorption fields and are difficult to overcome. Occasional flooding, high shrink-swell potential, and low strength are severe limitations for dwellings, small commercial buildings, and roads and streets. These limitations are difficult to overcome. Capability unit IIIw-3; woodland suitability group 2w6; pasture and hayland group 1A.

52—Una silty clay loam, occasionally flooded. This soil is deep, poorly drained, and level. It is on flood plains of streams draining the Blackland Prairies. Slopes are 0 to 1 percent. The areas are about 5 to 500 acres in size.

Typically, the surface layer is dark gray silty clay loam about 7 inches thick. The upper part of the subsoil is dark gray, mottled silty clay; it extends to a depth of about 17 inches. The middle part of the subsoil is gray, mottled clay loam; it extends to a depth of about 32 inches. The lower part of the subsoil is gray, mottled clay; it extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. The surface layer and subsoil are strongly acid or very strongly acid, except where the surface has been limed. Permeability is very slow, and the available water capacity is high. The water table is seasonally high and within 12 inches of the surface late in winter and early in spring. This soil generally is flooded about once every 2 years. Flooding usually occurs from January through March for periods of 1 to 7 days. Tilth is difficult to maintain because of the clayey texture. Crops respond well to fertilizer.

Included with soil in mapping are a few small areas of Marietta, Terouge, and Tuscumbia soils.

Some areas of this map unit are in a former munitions-impact area, the boundaries of which are shown on the soil maps, and are marked with craters. There may be unexploded munitions in these areas.

This soil has good potential for cultivated crops. Most of the acreage is cultivated. The main crops are soybeans, grain sorghum, and small grain. Rice is also suited to this soil. Runoff is very slow, and excess water is a hazard. Farming is delayed several days after a rain unless drainage systems are installed. Tillage is difficult because the clayey surface texture is sticky and plastic when the soil is wet and very hard when it is dry. Fallowing helps to improve tilth. Occasional flooding and wetness are the main limitations. Flood control measures and drainage can partially overcome these limitations. The soil has good potential for pasture. Adapted pasture plants include bermudagrass, tall fescue, and white clover. During wet periods livestock traffic will severely damage pasture plants. During winter months wetness limits access for supplemental grazing.

This soil has good potential for sweetgum and water tupelo. Wetness is a severe limitation for the use of equipment in planting, managing, and harvesting trees. This can be partially overcome by using special equipment and harvesting trees in drier seasons.

This soil has poor potential for most urban uses. Wetness and flooding are severe limitations for septic tank absorption fields. Wetness, flooding, high shrink-swell potential, and low strength are severe limitations for dwellings, small commercial buildings, and roads and streets. The clayey surface texture is a severe limitation for foot trafficability in lawns and gardens. These limitations are difficult to overcome. Proper engineering design, flood control structures, and drainage systems, however, help to overcome some limitations. Capability unit IIIw-3; woodland suitability group 2w6; pasture and hayland group 1A.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture, and woodland; as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities; and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

W. WILSON FERGUSON, agronomist, Soil Conservation Service, helped prepare this section.

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil, including some not commonly grown in the survey area, are discussed; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are presented for each soil.

This section provides information about the overall agricultural potential of the survey area and about the management practices that are needed. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

In 1967 about 12 percent of the soil survey area was used for crops and about 21 percent was used for pasture and hay. The potential of the soils for an increased production of food is good. Much of the acreage of the potential good cropland is used as woodland or pasture.

Except for those on the Red River flood plains and the Blackland Prairies, the soils in Hempstead County are low in nitrogen, potassium, phosphorus, calcium, and organic matter. Many of the soils suitable for cultivation are erodible. In places, poor surface or internal drainage and the susceptibility to flooding are limitations.

Contour cultivation, terraces, and vegetative waterways are needed on sloping soils that are used for clean tilled crops. Row arrangement and suitable drainage are needed for good growth in wet areas.

Annual cover crops or grasses and legumes should be grown regularly in the cropping system if the hazard of erosion is severe or if the crops grown leave only a small amount of residue. Crop residue should be left on the surface to provide the soil with a protective cover.

A plowpan commonly forms in loamy soils that are not properly tilled or are tilled frequently with heavy equipment. Keeping tillage to a minimum, varying the depth of tillage, and tilling when the content of soil moisture is favorable help to prevent a plowpan from forming.

If left bare, the loamy soils tend to crust and pack during periods of heavy rainfall. Growing cover crops and managing crop residue help maintain good tilth. The soils that have a clayey surface layer can be tilled only within a narrow moisture range.

Soybeans is the main row crop grown in the county. A small acreage of grain sorghum, corn, cotton, wheat, and oats are grown. The major truck crops include watermelons and cantaloupes.

The amount of fertilizer and lime to be applied should be determined by soil tests, and it will depend upon the kinds of crops to be grown.

Coastal bermudagrass, common bermudagrass, and Pensacola bahiagrass are the summer perennials most commonly grown in the county. Coastal bermudagrass and Pensacola bahiagrass are fairly new to the county, but they are highly satisfactory in producing good quality forage. Johnsongrass is suited to many of the soils in the county. Tall fescue is the main winter perennial grass now grown. Annual lespedeza and white clover are the most commonly grown legumes and generally are grown in combination with grass. Alfalfa is also grown on the fertile, well drained soils in the bottom land adjacent to the Red River.

Proper grazing is essential for the production of high quality forage, stand survival, and erosion control. Maintaining sufficient topgrowth on the plants during the growing season and excluding or restricting grazing of tall fescue in summer insures vigorous, healthy growth. Brush control is essential, and weed control is often needed.

Grass pastures respond well to nitrogen, and those of grass and legume mixtures may require phosphate, potash, and lime at rates based on soil tests.

The soils of Hempstead County have been placed in pasture and hayland suitability groups. These groups are prepared to assist land users in selecting and managing suitable forage plants. The soils included in each group will grow similar kinds of forage plants and require similar treatment and management. Forage production for one soil in the group is essentially the same as for other soils in the group if management and treatment are the same. The pasture and hayland suitability groups are identified in the description of each soil mapping unit in the section, "Soil maps for detailed planning."

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 7. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the soil is not suited to the crop or the crop is not commonly grown on the soil or that a given crop is not commonly irrigated.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 7.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown; that good quality irrigation water is uniformly applied in proper amounts as needed; and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 7 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for engineering purposes.

In the capability system, all kinds of soil are grouped at three levels: capability class, subclass, and unit. These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability unit is identified in the description of each soil map unit in the section "Soil maps for detailed planning." Capability units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

Woodland management and productivity

JAMES T. BEENE, forester, Soil Conservation Service, helped prepare this section.

Virgin forest covered all of Hempstead County, except for areas of the blacklands that extend across the central part of the county. These areas were prairies of tall grasses or savannahs of mainly tall grasses and scattered hardwood trees.

The main commercial trees on the flood plains were oaks, sweetgum, baldcypress, cottonwood, sycamore, ash, and pecan. Oaks, sweetgum, and loblolly pine were on the flatwoods areas and oaks, pines, and hickories on the uplands. Woodland now makes up about 70 percent of the county.

Table 8 contains information useful to woodland owners or forest managers planning the use of soils for wood crops. Only the soils suitable for wood crops are listed, and the woodland suitability symbol for each soil is given. All soils bearing the same symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *Woodland suitability group*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates insignificant limitations or restrictions. If a soil has more than one limitation, priority in placing the soil into a limitation class is in the following order: x, w, t, d, c, s, f, and r.

The third element in the symbol, a numeral, indicates the kind of trees for which the soils in the group are best suited and also indicates the severity of the hazard or limitations. The numerals 1, 2, and 3 indicate slight, moderate, and severe limitations, respectively, and suitability for needleleaf trees. The numerals 4, 5, and 6 indicate slight, moderate, and severe limitations, respectively, and suitability for broadleaf trees. The numerals 7, 8, 9 indicate slight, moderate, and severe limitations, respectively, and suitability for both needleleaf and broadleaf trees.

In table 8 the soils are also rated for a number of factors to be considered in management. *Slight*, *moderate*, and *severe* are used to indicate the degree of major soil limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or equipment; *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree that the soil affects expected mortality of planted tree seedlings. Plant competition is not considered in the ratings. Seedlings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

The *potential productivity* of merchantable or *important trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. It is for 50 years for all trees except eastern cottonwood, which is for 30 years, and sycamore, which is for 35 years. Important trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suitable for commercial wood production and that are suited to the soils.

Wildlife habitat

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of habitat are very severe and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and rye.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bahiagrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wooly croton, and ragweed.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of hardwood plants are oak, cherry, sweetgum, apple, hickory, and grape. Examples of fruit-producing shrubs that are commercially available and suitable for planting on soils rated *good* are dogwood, autumn-olive, and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil properties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, cypress, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, or foliage used by wildlife or that provide cover and shade for some species of wildlife. Major soil properties that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and moisture. Examples of shrubs are fall huckleberry, beautyberry, dogwood, hazelnut, sumac, hawthorn, blackberry, and blueberry.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, sesbania, and cattail.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfront feeding areas, and ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kinds of wildlife attracted to these areas include bobwhite quail, road runner, meadowlark, field sparrow, cottontail rabbit, and red fox.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, cougar, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

JAMES L. JANSKI, civil engineer, Soil Conservation Service, helped prepare this section.

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational areas; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 10 shows, for each kind of soil, the degree and kind of limitations for building site development; table 11, for sanitary facilities; and table 13, for water management. Table 12 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 10. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 10 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 10 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 11 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good, fair*, and *poor*, which mean about the same as the *slight, moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. Where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 11 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

If it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 12 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction material. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 15 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low frost action potential, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor*.

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 12 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 15.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can restrict plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils or very firm clayey soils; soils that have suitable layers less than 8 inches thick; soils that have large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface horizon is generally preferred for topsoil because of its organic-matter content. This horizon is designated as A1 or Ap in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 13 the degree of soil limitation and soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Soil and site limitations are expressed as slight, moderate, and severe. *Slight* means that the soil properties and site features are generally favorable for the specified use and that any limitation is minor and easily overcome. *Moderate* means that some soil properties or site features are unfavorable for the specified use but can be overcome or modified by special planning and design. *Severe* means that the soil properties and site features are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance is required.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of the soil for use in embankments, dikes, and levees.

Aquifer-fed excavated ponds are bodies of water made by excavating a pit or dugout into a ground-water aquifer. Excluded are ponds that are fed by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Ratings in table 13 are for ponds that are properly designed, located, and constructed. Soil properties and site features that affect aquifer-fed ponds are depth to a permanent water table, permeability of the aquifer, quality of the water, and ease of excavation.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Irrigation is affected by such features as slope, susceptibility to flooding, hazards of water erosion and soil blowing, texture, presence of salts and alkali, depth of root zone, rate of water intake at the surface, permeability of the soil below the surface layer, available water capacity, need for drainage, and depth to the water table.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to intercept runoff. They allow water to soak into the soil or flow slowly to an outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock, hardpan, or other unfavorable material; large stones; permeability; ease of establishing vegetation; and resistance to water erosion, soil blowing, soil slipping, and piping.

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

The soils of the survey area are rated in table 14 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 14 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 11, and interpretations for dwellings without basements and for local roads and streets, given in table 10.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They have moderate slopes and have few or no stones or boulders on the surface.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features, engineering test data, and data obtained from physical and chemical laboratory analyses of soils.

Engineering properties

Table 15 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 15 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section "Soil series and morphology."

Texture is described in table 15 in the standard terms used by the U.S. Department of Agriculture (*6*). These terms are defined according to percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*1*).

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The estimated classification, without group index numbers, is given in table 15. Also in table 15 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and in plasticity index is estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

In some surveys, the estimates are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterburg limits extend a marginal amount across classification boundaries (1 or 2 percent), the classification in the marginal zone is omitted.

Physical and chemical properties

Table 16 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 17 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods after rains or after snow melts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings are also based on local information about floodwater levels in the area and the extent of flooding; and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Depth to bedrock is shown for all soils that are underlain by bedrock at a depth of 5 to 6 feet or less. For many soils, the limited depth to bedrock is a part of the definition of the soil series. The depths shown are based on measurements made in many soil borings and on other observations during the mapping of the soils. The kind of bedrock and its hardness as related to ease of excavation is also shown. Rippable bedrock can be excavated with a single-tooth ripping attachment on a 200-horsepower tractor, but hard bedrock generally requires blasting.

Cemented pans are hard subsurface layers, within a depth of 5 or 6 feet, that are strongly compacted (indurated). Such pans cause difficulty in excavation. The hardness of pans is similar to that of bedrock. A rippable pan can be excavated, but a hard pan generally requires blasting.

Physical and chemical analyses of selected soils

Physical and chemical data resulting from laboratory analyses can be useful to the soil scientist in classifying soils. These data are helpful in estimating available water capacity, acidity, cation exchange capacity, mineralogical composition, organic matter content, and other soil characteristics that affect management needs. The data help to develop concepts of soil formation and in rating soils for such nonfarm uses as residential, industrial, recreational, or transportational use.

Several factors are involved in selecting soils for laboratory analyses. The first soils considered are extensive and are most important in the survey area. A review is made of available laboratory data to determine the need for additional information on these particular soils. Generally, priority is given to soils for which little or no laboratory data are available.

In Hempstead County, soils representing 14 soil series were selected for laboratory analyses. Profiles of these soils are described in the section, "Soil series and morphology." The analyses were made by the University of Arkansas in Fayetteville. The results of these analyses are given in Tables 18 and 19.

Silt and clay particle size distribution was determined by the hydrometer method (*3*). Sands were measured by sieving (*7*).

Organic matter was determined by a modified Walkley-Black method. The organic matter is digested with potassium dichromate-sulfuric acid, and the quantity of chromic acid that is reduced is measured colorimetrically.

Soil pH was determined by a 1:1 rate of soil to water mixture. Available phosphorus was extracted with the Bray No. 1 solution (0.03 N ammonium fluride and 0.025 N hydrochloric acid) and measured colorimetrically.

The bases were extracted with 1 N, pH 7.0, ammonium acetate. Calcium, potassium, and sodium were determined with a flame-photometer, and magnesium was measured by atomic absorption. The extractable acidity was determined by the barium chloride-triethanolamine method (*7*).

The total extractable calcium, potassium, magnesium, sodium, and extractable acidity is an approximation of the cation exchange capacity of the soil. Except in the soils that contain soluble salts, base saturation was determined by dividing this total into the sum of calcium, potassium, magnesium, and sodium and multiplying by 100.

Engineering test data

Table 20 contains the results of engineering tests, which were performed by the Arkansas State Highway Department, on four soils important in Hempstead County. The table shows the specific location where the samples were taken, the depth to which the soil was sampled, and the results of tests that determine particle-size distribution and other properties significant in soil engineering.

Maximum dry density is the maximum dry unit weight of the soil when it has been compacted at optimum moisture content by the prescribed method of compaction. The moisture content which gives the highest dry unit weight is called the optimum moisture content for the specific method of compaction.

Mechanical analyses show the percentages, by weight, of soil particles that pass through sieves of specified sizes. Sand and coarser materials do not pass through the No. 200 sieve. Silt and clay pass through the No. 200 sieve. Silt is that material larger than 0.002 millimeter in diameter that passes through the No. 200 sieve, and clay is that fraction passing through the No. 200 sieve that is smaller than 0.002 millimeter in diameter.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a solid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material passes from solid to plastic. The liquid limit is the moisture content at which the material changes from plastic to liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic.

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetic order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*6*). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or map units, of each soil series are described in the section "Soil maps for detailed planning."

Alaga series

The Alaga series consists of deep, well drained to somewhat excessively drained, rapidly permeable, gently sloping soils that formed in thick sandy sediment of marine or fluvial origin. These soils are on hilltops and hillsides of the Coastal Plains. The native vegetation is mixed hardwoods and pine. Slopes are 3 to 8 percent.

Alaga soils are geographically associated with Briley and Smithdale soils. Briley soils are on a slightly lower landscape and have an argillic horizon. Smithdale soils are on slightly lower ridgetops and have an argillic horizon.

Typical pedon of Alaga fine sand, 3 to 8 percent slopes, in an idle field, in the NW1/4NE1/4SW1/4, sec. 1, T. 11 S., R. 24 W.

Ap—0 to 9 inches; grayish brown (10YR 5/2) fine sand; few fine faint dark brown mottles; single grained; loose; medium acid; clear smooth boundary.

C1—9 to 39 inches; brownish yellow (10YR 6/6) loamy fine sand; single grained; loose; medium acid; clear smooth boundary.

C2—39 to 48 inches; yellowish brown (10YR 5/6) loamy fine sand; single grained; loose; medium acid; clear wavy boundary.

C3—48 to 61 inches; reddish yellow (7.5YR 6/6) loamy fine sand; single grained; loose; strongly acid; gradual wavy boundary.

C4—61 to 80 inches; brownish yellow (10YR 6/8) loamy fine sand; single grained; loose; strongly acid.

The sandy horizon is more than 80 inches thick. Reaction is medium acid to very strongly acid throughout, except where the surface layer has been limed.

The A horizon is 5 to 10 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 6 or 8; hue of 7.5YR, value of 5, and chroma of 6 or 8; or value of 6 and chroma of 6. The lower part of the C horizon has no mottles to few mottles in shades of brown. The C horizon is loamy sand or loamy fine sand.

Bowie series

The Bowie series consists of deep, moderately well drained, moderately slowly permeable, nearly level to gently sloping soils on hilltops and convex hillsides of the Coastal Plains. These soils formed in thick loamy sediment of marine or fluvial origin. The native vegetation was mixed pine and hardwoods. Slopes are 1 to 8 percent.

Bowie soils are geographically associated with Saffell and Savannah soils. Saffell soils are on a higher landscape; they have a loamy-skeletal control section and are redder. Savannah soils occur on a similar landscape; they have less plinthite and have a fragipan.

Typical pedon of Bowie fine sandy loam, 3 to 8 percent slopes, in a moist forest area, in the SW1/4SE1/4NW1/4, sec. 19, T. 11 S., R. 23 W.

Ap—0 to 7 inches; brown (10YR 5/3) fine sandy loam; moderate fine and medium granular structure; friable; few large and many fine roots; many fine pores; few dark brown stains; strongly acid; abrupt smooth boundary.

B21t—7 to 16 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; few large and many fine roots; many fine pores; few pale brown (10YR 6/3) worm casts and fillings in large voids; strongly acid; clear smooth boundary.

B22t—16 to 31 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; patchy clay films on most faces of peds; common fine roots; common fine pores; very strongly acid; clear smooth boundary.

B23t—31 to 44 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/6) and common medium distinct very pale brown (10YR 7/3) mottles; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; few fine roots; common fine pores; 5 percent of volume plinthite; few pockets of uncoated sand grains; very strongly acid; clear wavy boundary.

B24t—44 to 59 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/6) and common fine and medium distinct light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; few fine roots; few fine pores; 7 percent of volume plinthite; few pockets of uncoated sand grains; very strongly acid; clear wavy boundary.

B25t—59 to 72 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/6) and common fine and medium distinct light gray (10YR 7/2) mottles; weak medium subangular blocky structure; firm; patchy clay films on most faces of peds; few fine roots; few fine pores; 7 percent of volume plinthite; few pockets of uncoated sand grains; very strongly acid.

The solum is 60 to more than 72 inches thick. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed.

The A horizon is 6 to 18 inches thick. The A1 or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. If present, the A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3.

The B2t horizon has hue of 10YR, value of 5, and chroma of 4, or value of 5 or 6 and chroma of 6 or 8; hue of 7.5YR, value of 5, and chroma of 6, or value of 5 or 6 and chroma of 8. The lower part of the B horizon has mottles in shades of red, brown, and gray. Content of plinthite ranges from about 5 to 11 percent. Texture is fine sandy loam, clay loam, or sandy clay loam.

Briley series

The Briley series consists of deep, well drained, moderately permeable, gently sloping to rolling soils that formed in thick beds of sandy and loamy sediment of the Coastal Plains. These soils are on hilltops and hillsides. The native vegetation was mixed pine and hardwoods. Slopes are 3 to 20 percent.

Briley soils are geographically associated with the Alaga and Smithdale soils. Alaga soils are on a slightly higher landscape; they are sandier throughout and do not have an argillic horizon. Smithdale soils are on a more dissected landscape; they have an argillic horizon and do not have a thick sandy surface.

Typical pedon of Briley loamy fine sand, 3 to 8 percent slopes, in a moist pine plantation, in the SW1/4SW1/4SE1/4, sec. 1, T. 11 S., R. 24 W.

O1—1 to 1/2 inch; pine needles and forest debris.

O2—1/2 inch to 0; partially decomposed forest debris.

Ap—0 to 7 inches; pale brown (10YR 6/3) loamy fine sand; weak fine granular structure; very friable; medium acid; clear smooth boundary.

A2—7 to 19 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak fine granular structure; very friable; strongly acid; clear wavy boundary.

A3—19 to 31 inches; reddish yellow (7.5YR 6/6) loamy fine sand; weak fine granular structure; very friable; very strongly acid; abrupt wavy boundary.

B21t—31 to 53 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of peds; few fine roots; few fine pores; very strongly acid; gradual wavy boundary.

B22t—53 to 72 inches; yellowish red (5YR 5/6) fine sandy loam; common medium prominent yellowish brown (10YR 5/6) and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of peds; few fine roots; few fine pores; very strongly acid; gradual wavy boundary.

The solum is 65 to more than 80 inches thick. Reaction is medium acid to very strongly acid throughout except where the surface layer has been limed.

The A horizon is 20 to 40 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3. The A2 horizon has hue of 10YR, value of 6, and chroma of 3 or 4. The A3 horizon has hue of 7.5YR, value of 5 or 6, and chroma of 6; or value of 5 and chroma of 4.

The B2t horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8; or it has hue of 2.5YR, value of 4, and chroma of 6 or 8. The lower part of the Bt horizon has mottles in shades of brown. Texture is fine sandy loam, sandy clay loam, or loam.

Demopolis series

The Demopolis series consists of shallow, well drained, slowly permeable, gently sloping to moderately sloping soils that formed in residuum from calcareous chalk. This soil occurs on gullied hilltops and hillsides in the Blackland Prairie area. The native vegetation was prairie grasses intermingled in places with eastern redcedar and Bois d'arc. Slopes are 3 to 12 percent.

Demopolis soils are geographically associated with Houston, Oktibbeha, and Sumter soils. Houston soils are on a similar landscape, have a darker surface layer, and are deeper to chalk. Oktibbeha soils are on a similar landscape and have reddish argillic horizons. Sumter soils are on a similar landscape and have cambic horizons.

Typical pedon of Demopolis silty clay loam, gullied, in a moist idle area, in the SW1/4SW1/4NE1/4, sec. 8, T. 11 S., R. 25 W.

Ap—0 to 4 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate fine granular structure; friable, slightly sticky; few fine roots; about 10 percent by volume of soft platy fragments of chalk; few brachiopods; calcareous; moderately alkaline; abrupt wavy boundary.

C—4 to 10 inches; light brownish gray (2.5Y 6/2) very gravelly silty clay loam; massive; firm; common medium distinct olive gray (5Y 4/2) mottles; 70 percent of volume is chalk; few brachiopods; calcareous; moderately alkaline; abrupt wavy boundary.

Cr—10 to 14 inches; rippable chalk; hardness less than 3 on Mohs' scale.

Depth to chalk ranges from 4 to 14 inches. Reaction is moderately alkaline and calcareous throughout.

The A horizon is 2 to 8 inches thick. It has hue of 10YR, value of 4 through 6, and chroma of 2 or hue of 2.5Y, value of 5, and chroma of 2. The content of chalk fragments less than 3 inches in diameter ranges from 5 to 14 percent.

The C horizon has hue of 10YR, value of 5 through 7, and chroma of 2 or hue of 2.5Y, value of 5 or 6, and chroma of 2. Mottles in shades of yellow, olive, and gray are few to common. The C horizon is silty clay loam, loam, or silt loam. The content of chalk fragments less than 3 inches in diameter ranges from 65 to 85 percent.

Desha series

The Desha series consists of deep, somewhat poorly drained, very slowly permeable, level soils that formed in thick beds of fine textured, slack water deposits from the Red River. They have a seasonally high water table during the winter and spring months. This soil occurs on flood plains of the Red River. The native vegetation was mixed hardwood forests, which were predominantly water-tolerant species. Slopes are 0 to 1 percent.

Desha soils are geographically associated with the Latanier, Perry, and Portland soils. Latanier soils, which are on a slightly higher landscape, have thinner sola. Perry soils and Portland soils are on a slightly lower landscape, do not have mollic epipedons, and are more acid.

Typical pedon of Desha clay, occasionally flooded, in a moist wooded area, in the NW1/4SW1/4SW1/4, sec. 9, T. 14 S., R. 25 W.

O1—1/2 to 1/4 inch; leaves and forest debris.

O2—1/4 inch to 0; partially decomposed forest debris.

A1—0 to 4 inches; dark reddish brown (5YR 3/2) clay; moderate fine subangular blocky structure; firm, sticky and plastic; common fine and medium roots; mildly alkaline; clear smooth boundary.

B21—4 to 12 inches; dark reddish brown (5YR 3/3) clay; strong medium subangular blocky structure; very firm, sticky and plastic; many slickensides; common fine and few medium roots; few fine pores; few calcium carbonate concretions; mildly alkaline; gradual wavy boundary.

B22—12 to 27 inches; dark reddish brown (5YR 3/4) clay; strong medium subangular blocky structure; very firm, sticky and plastic; many slickensides; few fine and medium roots; few fine pores; few calcium carbonate concretions; mildly alkaline; gradual wavy boundary.

B23—27 to 43 inches; dark reddish brown (5YR 3/4) clay; few fine faint yellowish red mottles; strong medium subangular blocky structure; very firm, sticky and plastic; many slickensides; few fine roots; few fine pores; few calcium carbonate concretions; mildly alkaline; gradual smooth boundary.

B31—43 to 58 inches; dark reddish brown (5YR 3/4) silty clay; few fine faint yellowish red mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; few slickensides; few fine roots; few fine pores; few calcium carbonate concretions; mildly alkaline; gradual wavy boundary.

B32—58 to 72 inches; dark reddish brown (5YR 3/4) clay; few fine faint yellowish red mottles; weak medium blocky structure; very firm; sticky and plastic; few slickensides; few fine roots; few fine pores; few calcium carbonate concretions; mildly alkaline.

The solum is about 40 to 70 inches or more thick. Reaction is slightly acid to mildly alkaline throughout.

The A horizon ranges from 3 to 7 inches in thickness. It has hue of 5YR, value of 3, and chroma of 2 or 3.

The B2 horizon has hue of 5YR, value of 3 or 4, and chroma of 3 or 4; or it has hue of 2.5YR, value of 3 or 4, and chroma of 4. Few to many mottles are in shades of gray, brown, or red. Texture is clay. The B3 horizon has colors similar to the colors of the B2 horizon. Texture is silty clay or clay.

Gore series

The Gore series consists of deep, moderately well drained, very slowly permeable, nearly level soils on Red River terraces. These soils formed in clayey alluvial deposits and occur on broad terraces that parallel the Red River flood plain. The native vegetation was mixed pine and hardwood forest. Slopes are 0 to 2 percent.

Gore soils are geographically associated with McKamie soils, which are on steeper slopes and are better drained.

Typical pedon of Gore silt loam, 0 to 2 percent slopes, in a moist wooded area, in the SE1/4SE1/4SW1/4, sec. 1, T. 14 S., R. 26 W.

O1—1 to 1/2 inch; pine needles and forest debris.

O2—1/2 inch to 0; partially decomposed forest debris.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; few large and many fine roots; medium acid; clear smooth boundary.

B1—4 to 8 inches; brown (10YR 5/3) loam; weak medium subangular blocky structure; friable; common fine and medium roots; medium acid; abrupt wavy boundary.

B21t—8 to 14 inches; red (2.5YR 5/6) clay; few fine prominent pale brown mottles; strong medium angular and subangular blocky structure; very firm, sticky and plastic; common thick clay films on faces of peds; few fine roots; few fine pores; very strongly acid; clear smooth boundary.

B22t—14 to 20 inches; red (2.5YR 5/6) clay; common fine prominent light brownish gray mottles; strong medium angular and subangular blocky structure; very firm, sticky and plastic; common thick clay films on faces of peds; few fine roots; few fine pores; very strongly acid; gradual smooth boundary.

B23t—20 to 31 inches; light brownish gray (10YR 6/2) clay; common coarse prominent red (2.5YR 5/6) mottles; strong medium subangular blocky structure; very firm, sticky and plastic; common thick clay films on faces of peds; few fine roots; few fine pores; very strongly acid; gradual wavy boundary.

B31tg—31 to 43 inches; gray (10YR 6/1) clay; common medium prominent yellowish red (5YR 5/8) and few fine prominent yellowish brown mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; thick patchy clay films on faces of peds; very strongly acid; abrupt wavy boundary.

B32t—43 to 57 inches; yellowish red (5YR 4/6) clay; moderate medium subangular blocky structure; very firm, sticky and plastic; few slickensides; mildly alkaline; gradual wavy boundary.

C—57 to 72 inches; red (2.5YR 4/6) clay; massive; very firm; moderately alkaline.

The solum is 40 to 60 inches thick. Reaction of the A horizon is medium acid or strongly acid except where the surface layer has been limed. Reaction of the upper B2t horizon is strongly acid or very strongly acid and of the lower B2t horizon is very strongly acid to mildly alkaline. The B3t and C horizons range from medium acid to moderately alkaline.

The A horizon is 1 to 8 inches thick. The Ap horizon, where present, has hue of 10YR, value of 4 or 6, and chroma of 2 or value of 5 and chroma of 2 or 3.

The B21t and B22t horizons have hue of 2.5YR, value of 4, and chroma of 6, or they have hue of 5YR, value of 5, and chroma of 6. Few to common mottles are in shades of gray and brown. The B23t and B31t horizons have hue of 10YR, value of 6, and chroma of 1 or 2. Few to common mottles are in shades of red and brown. The B32t horizon has colors similar to those of the B21t and B22t horizons. The B horizon is silty clay or clay.

The C horizon has colors similar to those of the B32t horizon. Some pedons contain few to common calcium carbonate concretions.

Guyton series

The Guyton series consists of deep, poorly drained, level soils on flood plains of the Coastal Plains. These soils formed in silty alluvial sediment. They have a seasonally high water table during the winter and spring. The native vegetation was mixed hardwoods and a few pines. Slopes are 0 to 1 percent.

Guyton soils are geographically associated with Kirvin, Ouachita, Sardis, and Smithton soils. Kirvin soils occur on strongly dissected uplands and have a redder argillic horizon and a clayey control section. Ouachita soils occur on natural levees on flood plains, are browner, have cambic horizons, and are well drained. Sardis soils occur on a slightly higher landscape, are browner, have cambic horizons, and are well drained. Smithton soils occur on upland or terrace flats and have coarse-loamy control sections.

Typical pedon of Guyton silt loam, occasionally flooded, in a moist wooded area in the NE1/4NW1/4SW1/4, sec. 33, T. 13 S., R. 23 W.

O1—1/2 to 1/4 inch; oak leaves and forest debris.

O2—1/4 inch to 0; partially decomposed forest debris.

A1—0 to 7 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/4) mottles and common fine faint gray mottles; weak fine and medium granular structure; friable; many medium and fine roots; very strongly acid; clear smooth boundary.

A2g—7 to 16 inches; gray (10YR 6/1) silt loam; common medium distinct yellowish brown (10YR 5/4) and common fine faint pale brown mottles; weak medium subangular blocky structure; friable; few medium and many fine roots; common fine pores; few fine black concretions; strongly acid; abrupt irregular boundary.

B21tg&A2g—16 to 28 inches; gray (10YR 5/1) silty clay loam and 20 percent gray (10YR 6/1) silt loam tongues 3 to 4 inches wide; common medium distinct yellowish brown (10YR 5/4) mottles; silty clay loam has moderate medium subangular blocky structure; firm; silt loam is massive; friable; common thin clay films on faces of peds; clay films in pores; few fine roots; few fine pores; few fine black concretions; strongly acid; gradual wavy boundary.

B22tg&A2g—28 to 39 inches; gray (10YR 5/1) silty clay loam and 15 percent gray (10YR 6/1) silt loam tongues 1 to 3 inches wide; common medium yellowish brown (10YR 5/4) and few fine faint pale brown mottles; silty clay loam has moderate medium subangular blocky structure; firm; silt loam is massive; friable; common thin clay films on faces of peds; clay films in pores; few fine roots; few fine pores; few fine black concretions; very strongly acid; clear wavy boundary.

B23tg—39 to 47 inches; gray (10YR 5/1) loam and 10 percent gray (10YR 6/1) silt loam tongues 1/2 to 1 inch wide; common medium distinct yellowish brown (10YR 5/4) and common medium faint gray (10YR 5/1) mottles; loam has moderate medium subangular blocky structure; firm; silt loam is massive; friable; common thin clay films on faces of peds; clay films in pores; few fine roots; few fine pores; few fine black concretions; very strongly acid; gradual wavy boundary.

B24tg—47 to 61 inches; gray (10YR 5/1) loam and 5 percent gray (10YR 6/1) silt loam tongues 1/4 to 1/2 inch wide; common coarse distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/6) and common medium faint gray (10YR 5/1) mottles; loam has moderate medium subangular blocky structure; firm; silt loam is massive; friable; common thin clay films on faces of peds; clay films in pores; few fine roots; few fine pores; few fine black concretions; very strongly acid; gradual wavy boundary.

B3tg—61 to 72 inches; gray (10YR 5/1) loam; common coarse distinct yellowish brown (10YR 5/6) and common coarse light gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm; few thin clay films on faces of peds; few gray (10YR 6/1) silt coatings on ped surfaces; few fine roots; few fine pores; few fine black concretions; very strongly acid.

The solum is 52 to 80 inches thick. Reaction ranges from very strongly acid to medium acid in the surface layer and the upper part of the subsoil. Reaction in the lower part of the subsoil ranges from very strongly acid through moderately alkaline.

The A horizon is 12 to 30 inches thick. The A1 or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3 or value of 6 and chroma of 2. The A2 horizon has hue of 10YR, value of 5 through 7, chroma of 1, or value of 6 and chroma of 2. Mottles in shades of brown are few to common.

The Bt horizon has hue of 10YR, value of 6, and chroma of 1 or 2, or value of 5 and chroma of 1; or hue of 2.5Y, value of 6, and chroma of 2. Common, medium to coarse mottles are in shades of brown. Texture is silt loam, silty clay loam, loam, or clay loam.

Harleston series

The Harleston series consists of deep, moderately well drained, moderately permeable, nearly level to gently sloping upland soils on hilltops, hillsides, and low terraces. These soils formed in thick, loamy marine or alluvial sediment of the Coastal Plains. The native vegetation was hardwood forest or mixed hardwood and pine forest. Slopes are 1 to 8 percent.

Harleston soils are geographically associated with Ruston and Smithton soils. Ruston soils occur on a slightly higher landscape, have a fine-loamy control section, and are better drained. Smithton soils occur in broad, depressed areas, have a grayer subsoil, and are poorly drained.

Typical pedon of Harleston loamy fine sand, 3 to 8 percent slopes, in a moist pasture area, in the SW1/4-SE1/4SE1/4, sec. 5, T. 11 S., R., 23 W.

Ap—0 to 7 inches; brown (10YR 5/3) loamy fine sand; common fine faint yellowish brown and few fine faint dark grayish brown mottles; moderate medium granular structure; very friable; common fine roots; few crayfish holes; slightly acid; clear smooth boundary.

B21t—7 to 21 inches; yellowish brown (10YR 5/6) fine sandy loam; few fine faint pale brown and light brownish gray and common medium distinct dark grayish brown (10YR 4/2) mottles; weak medium subangular blocky structure; friable; few patchy clay films on faces of peds; common fine roots; few fine pores; few crayfish holes; medium acid; clear smooth boundary.

B22t—21 to 36 inches; yellowish brown (10YR 5/6) fine sandy loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; patchy thin clay films on faces of peds; few fine roots; few fine pores; few crayfish holes; strongly acid; clear wavy boundary.

B23t—36 to 51 inches; mottled gray (10YR 6/1), yellowish brown (10YR 5/8), and pale brown (10YR 6/3) fine sandy loam; moderate medium subangular blocky structure; friable; patchy thin clay films on faces of peds; few fine roots; few fine pores; few crayfish holes; few iron-manganese concretions; very strongly acid; clear wavy boundary.

B24t—51 to 60 inches; yellowish brown (10YR 5/4) fine sandy loam; common coarse distinct gray (10YR 5/1) and common medium faint yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few crayfish holes; very strongly acid; gradual wavy boundary.

B25t—60 to 72 inches; mottled gray (10YR 6/1), dark yellowish brown (10YR 4/4), and yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine pores; few crayfish holes; very strongly acid.

The solum exceeds 60 inches in thickness. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed.

The A horizon is 5 to 12 inches thick. The A1 or Ap horizon has hue of 10YR, value of 4, and chroma of 1 through 3 or value of 5 and chroma of 3. If present, the A2 horizon has hue of 10YR, value of 6, and chroma of 3 or 4.

The upper part of the B horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8 or value of 6 and chroma of 4 or 6. It has no mottles to many gray mottles. The lower part of the B horizon is mottled in shades of gray, brown, and red. The upper part is fine sandy loam or loam. The lower part is fine sandy loam, loam, or sandy clay loam.

Houston series

The Houston series consists of deep, moderately well drained, slowly permeable, nearly level to gently sloping soils that formed in residuum from chalk. These soils occur on hilltops and hillsides in the Blackland Prairie area. The native vegetation is prairie grasses, Bois d'arc, and eastern redcedar. Slopes are 1 to 8 percent.

Houston soils are geographically associated with Demopolis, Kipling, Oktibbeha, and Sumter soils, which are on a similar landscape. Demopolis soils have chalk within 20 inches of the surface and do not have a mollic epipedon. Kipling soils have argillic horizons and are more acid. Oktibbeha soils have reddish argillic horizons that are acid. Sumter soils are shallower to chalk, have cambic horizons, and do not have a mollic epipedon.

Typical pedon of Houston clay, 3 to 8 percent slopes, eroded, in a moist pasture area, in the NW1/4-NE1/4, sec. 6, T. 12 S., R. 24 W.

Ap—0 to 7 inches; very dark gray (5Y 3/1) clay; moderate medium granular structure; very firm, sticky and plastic; many medium and fine roots; few fine pores; mildly alkaline; clear smooth boundary.

A12—7 to 22 inches; dark olive gray (5Y 3/2) clay; common fine distinct olive mottles; common intersecting slickensides form parallelepipeds that part to moderate medium blocky structure; very firm, sticky and plastic; many shiny pressure faces; many fine roots; few fine pores; few calcium carbonate concretions; mildly alkaline; abrupt irregular boundary.

AC—22 to 52 inches; olive (5Y 5/3) clay with common wedges of dark olive gray (5Y 3/2) clay from A horizon; common intersecting slickensides form parallelepipeds that part to moderate medium blocky structure; very firm, sticky and plastic; many shiny pressure faces; few fine roots; few fine pores; many calcium carbonate concretions; moderately alkaline; gradual smooth boundary.

C1—52 to 64 inches; light olive brown (2.5Y 5/6) clay; common fine distinct gray mottles; few wedges of dark olive gray (5Y 3/2) clay from A horizon; common intersecting slickensides form parallelepipeds that part to moderate medium blocky structure; very firm, sticky and plastic; many shiny pressure faces; few fine roots; few fine pores; few calcium carbonate concretions; moderately alkaline; calcareous; gradual wavy boundary.

C2—64 to 72 inches; light olive brown (2.5Y 5/6) clay; common coarse distinct gray (10YR 5/1) mottles; few wedges of dark olive gray (5Y 3/2) clay from A horizon; massive; very firm; sticky and plastic; many shiny pressure faces; few intersecting slickensides; few fine roots; few crayfish holes; few fine pores; few calcium carbonate concretions; mildly alkaline; calcareous.

Depth to chalk ranges from 4 feet to more than 6 feet. Reaction of the A and AC horizons ranges from slightly acid to moderately alkaline. The C horizon ranges from slightly acid to moderately alkaline, and it generally is calcareous. Few to many calcium carbonate concretions occur throughout the profile.

The A horizon is 10 to 24 inches thick. It has hue of 10YR, value of 2, and chroma of 1, value of 3 and chroma of 1 or 2; hue of 2.5Y, value of 3, and chroma of 2; or hue of 5Y, value of 2 or 3, and chroma of 1 or 2.

The AC horizon has hue of 2.5Y, value of 4 or 5, and chroma of 2 or hue of 5Y, value of 4 or 5, and chroma of 2 or 3.

The C horizon has hue of 2.5Y, value of 4, and chroma of 4, or value of 5 and chroma of 4 or 6; or hue of 5Y, value of 4, and chroma of 4. Few to common mottles are in shades of brown, yellow, and gray.

Kipling series

The Kipling series consists of deep, somewhat poorly drained, very slowly permeable, nearly level to gently sloping soils that formed in acid clay underlain with chalk or marl. These soils occur on hilltops and hillsides in areas of the Coastal Plains and Blackland Prairies. The native vegetation is mixed hardwoods and pines. Slopes are 1 to 8 percent.

Kipling soils are geographically associated with Houston, Millwood, and Oktibbeha soils, which occur on a similar landscape. Houston soils have a mollic epipedon and do not have an argillic horizon. Millwood soils are well drained and have deeper sola and redder argillic horizons. Oktibbeha soils have redder argillic horizons and are better drained.

Typical pedon of Kipling loam, 1 to 3 percent slopes, in a moist idle area, in the SE1/4NE1/4NE1/4, sec. 31, T. 10 S., R. 25 W.

Ap—0 to 6 inches; brown (10YR 5/3) loam; common fine faint light brownish gray mottles; few very dark grayish brown organic stains; moderate medium and fine granular structure; friable; many medium and fine roots; slightly acid; clear smooth boundary.

B21t—6 to 20 inches; yellowish brown (10YR 5/8) clay; common fine prominent yellowish red and gray mottles; strong fine angular and subangular blocky structure; firm, sticky and plastic; common thick clay films on faces of peds; few medium and common fine roots; few fine pores; few crayfish holes; few small oxide concretions; strongly acid; clear smooth boundary.

B22t—20 to 35 inches; mottled yellowish brown (10YR 5/6) and gray (10YR 6/1) clay; strong fine angular and subangular blocky structure; firm, sticky and plastic; common thick clay films on faces of peds; few fine pores; few crayfish holes; few small oxide concretions; very strongly acid; clear smooth boundary.

B23t—35 to 45 inches; mottled yellowish brown (10YR 5/6) and gray (10YR 6/1) clay; strong fine angular and subangular blocky structure; firm, sticky and plastic; few slickensides; common thick clay films on faces of peds; few fine roots; few fine pores; few crayfish holes; few small oxide concretions; very strongly acid; clear smooth boundary.

B3—45 to 54 inches; mottled gray (10YR 5/1), yellowish brown (10YR 5/6), and light olive brown (2.5Y 5/6) clay; moderate medium angular and subangular blocky structure; very firm, sticky and plastic; common slickensides; few fine roots; few fine pores; few crayfish holes; strongly acid; clear smooth boundary.

C—54 to 72 inches; mottled light olive brown (2.5Y 5/6) and gray (10YR 5/1) clay; massive; very firm; sticky and plastic; common slickensides; few fine roots; few fine pores; few crayfish holes; moderately alkaline.

The solum is 25 to 55 inches thick. Depth to marl ranges from 36 inches to more than 80 inches. The A and Bt horizons range from medium acid through extremely acid. The B3 and C horizons range from strongly acid through moderately alkaline.

The A1 or Ap horizon is 1 to 9 inches thick. The A1 or Ap horizon has hue of 10YR, value of 3, and chroma of 3; value of 4 and chroma of 1 or 2; or value of 5 and chroma of 3. In addition, the A1 or Ap horizon has hue of 5Y, value of 4, and chroma of 1 or hue of 2.5Y, value of 4, and chroma of 2. If present, the A2 horizon has hue of 10YR, value of 6, and chroma of 2 or 3. Texture is loam or silty clay loam.

The Bt horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8; or hue of 7.5YR, value of 5, and chroma of 6. Few to common mottles are in shades of gray and red. Texture is silty clay loam, silty clay, or clay.

The C horizon has hue of 10YR, value of 5, and chroma of 1 or 2; or it has hue of 2.5Y, value of 5, and chroma of 4 or 6. Texture is silty clay or clay.

Kirvin series

The Kirvin series consists of deep, well drained, moderately slowly permeable, gently sloping to rolling soils that formed in thick, loamy and clayey marine sediment. These soils are on hilltops and hillsides of the Coastal Plains. The native vegetation was pine and mixed hardwoods. Slopes are 3 to 20 percent.

Kirvin soils are geographically associated with Guyton and Sacul soils. Guyton soils occur on adjacent flood plains, are more poorly drained, and have a fine-silty control section. Sacul soils occur on a slightly lower landscape and have gray mottles in the upper part of the argillic horizon.

Typical pedon of Kirvin fine sandy loam, 3 to 8 percent slopes, in the SE1/4NE1/4SW1/4, sec. 18, T. 14 S., R. 23 W.

O1—1 to 1/2 inch; pine needles and forest debris.

O2—1/2 inch to 0; partially decomposed forest debris.

A1—0 to 5 inches; brown (10YR 5/3) fine sandy loam; common medium faint dark brown (10YR 4/3) mottles; moderate medium granular structure; very friable; many medium and fine roots; about 2 percent by volume fragments of ironstone; strongly acid; clear smooth boundary.

B21t—5 to 10 inches; yellowish red (5YR 5/8) clay loam; brown (10YR 5/3) fine sandy loam in root channels; weak fine subangular blocky structure; friable; few patchy clay films on faces of peds; many fine roots; few fine pores; about 2 percent by volume fragments of ironstone; strongly acid; clear smooth boundary.

B22t—10 to 30 inches; red (2.5YR 4/8) clay; strong medium angular and subangular blocky structure; firm; many thick clay films on faces of peds; clay films in pores; many fine roots; few fine pores; about 1 percent by volume fragments of ironstone; strongly acid; gradual smooth boundary.

B23t—30 to 41 inches; red (2.5YR 4/8) sandy clay; few small pockets of yellowish brown (10YR 5/6) fine sandy loam; moderate medium subangular blocky structure; firm; few thick and many thin clay films on faces of peds; clay films in pores; few fine roots; few fine pores; about 5 percent by volume fragments of ironstone; strongly acid; gradual wavy boundary.

B24t—41 to 56 inches; red (2.5YR 4/8) clay; few fine prominent gray, pale brown, and yellowish brown mottles; moderate medium subangular blocky structure; firm; few thick and many thin clay films on faces of peds; few fine roots; few fine pores; about 2 percent by volume fragments of ironstone, very strongly acid; clear wavy boundary.

C—56 to 72 inches; variegated colors of yellowish red (5YR 4/6), yellowish brown (10YR 5/6), and dark brown (10YR 4/3) stratified clay loam and sandstone; massive; firm; hard when dry; few fine roots; few fine pores; about 10 percent by volume fragments of ironstone; one stratum observed was sandstone, which was 1/2 inch thick and continuously horizontal across the horizon; very strongly acid.

The solum is 40 to 60 inches thick. Reaction is strongly acid to extremely acid throughout except where the surface layer has been limed.

The A horizon ranges from 3 to 9 inches thick. The A horizon has hue of 10YR, value of 4, and chroma of 2 or 3 or value of 5 or 6 and chroma of 3.

The Bt horizon has hue of 5YR or 2.5YR, value of 4, and chroma of 6 or 8 or value of 5 and chroma of 8. The upper part has no mottles to few yellowish brown mottles, and the lower part has few to common mottles in shades of yellowish brown, gray, and red. The upper part of the B horizon is clay, clay loam, or sandy clay. The lower part is sandy loam, loam, sandy clay loam, or clay loam. Content of ironstone fragments range from 1 to 10 percent throughout.

The C horizon is stratified sandy loam, sandy clay loam, loam, or clay loam.

Latanier series

The Latanier series consists of deep, somewhat poorly drained, very slowly permeable, level to nearly level soils on natural levees of the Red River flood plain. These soils formed in clayey sediment overlying loamy or sandy sediment. The native vegetation was mixed hardwood forest that had an understory of vines and canes. Slopes are 0 to 2 percent.

Latanier soils are geographically associated with Desha, Oklared, and Sterlington soils. Desha soils occur in slack water areas and have thicker sola. Oklared soils generally occur next to the stream channel and have a coarse-loamy control section. Sterlington soils occur slightly higher on the landscape, do not have a mollic epipedon, and have a coarse-silty control section.

Typical pedon of Latanier silty clay, occasionally flooded, in a moist soybean field in the SE 1/4-NW1/4SE1/4, sec. 19, T. 14 S., R. 25 W.

Ap1—0 to 3 inches; dark reddish brown (5YR 3/3) silty clay; moderate medium granular structure; firm; many medium and fine roots; moderately alkaline; clear smooth boundary.

Ap2—3 to 7 inches; dark reddish brown (5YR 3/2) silty clay; moderate medium subangular blocky structure; firm; many pressure faces; many medium and few fine roots; moderately alkaline; clear smooth boundary.

B21—7 to 19 inches; dark reddish brown (5YR 3/3) clay; few fine distinct yellowish red mottles; moderate medium subangular blocky structure; firm; many pressure faces; few medium and many fine roots; moderately alkaline; calcareous; gradual smooth boundary.

B22—19 to 26 inches; dark reddish brown (5YR 3/4) silty clay; few fine distinct yellowish red mottles; moderate medium subangular blocky structure; firm; many pressure faces; few fine roots; moderately alkaline; calcareous; clear smooth boundary.

IIC1—26 to 32 inches; reddish brown (5YR 4/4) silt loam; massive; friable; few fine roots; moderately alkaline; calcareous; clear smooth boundary.

IIC2—32 to 47 inches; yellowish red (5YR 5/6) very fine sandy loam; massive; very friable; few fine roots; moderately alkaline; calcareous; gradual smooth boundary.

IIC3—47 to 59 inches; yellowish red (5YR 5/8) very fine sandy loam; massive; very friable; few fine roots; moderately alkaline; calcareous; clear smooth boundary.

IIC4—59 to 72 inches; reddish yellow (5YR 6/8) very fine sand; massive; very friable; many thin discontinuous bedding planes of yellowish red (5YR 4/8) fine sandy loam; few fine roots; moderately alkaline; calcareous.

Solum thickness and depth to contrasting textures range from 20 to about 40 inches. The soil is neutral to moderately alkaline throughout, and the B horizon and underlying material generally are calcareous.

The A horizon is 4 to 8 inches thick. It has hue of 5YR, value of 3, and chroma of 2 or 3.

The upper B horizon has hue of 5YR or 2.5YR, value of 3, and chroma of 3. The lower B horizon has hue of 5YR or 2.5YR, value of 3 or 4, and chroma of 3 or 4. The B horizon is silty clay or clay.

The C horizon is stratified silt loam or very fine sandy loam.

Marietta series

The Marietta series consists of deep, moderately well drained, moderately permeable, level soils on flood plains. These soils formed in loamy alluvial sediment from Blackland Prairie and Coastal Plains. The native vegetation was mixed hardwoods. Slopes are 0 to 1 percent.

Marietta soils are geographically associated with Terouge, Tuscumbia, and Una soils, which occur on a similar landscape. Terouge soils have a grayer subsoil and have a fine control section. Tuscumbia soils have a grayer subsoil and have a fine control section.

Typical pedon of Marietta loam, occasionally flooded, in a moist pasture area, in the NE1/4NE1/4SW1/4, sec. 4, T. 12 S., R. 25 W.

Ap—0 to 7 inches; brown (10YR 5/3) loam; moderate fine and medium granular structure; friable; many medium and fine roots; medium acid; clear smooth boundary.

B21—7 to 15 inches; brown (10YR 5/3) loam; weak medium subangular blocky structure; friable; few medium and few fine roots; slightly acid; clear wavy boundary.

B22—15 to 21 inches; mottled brown (10YR 5/3), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/8) loam; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; few iron-manganese concretions; medium acid; clear wavy boundary.

B23g—21 to 42 inches; light brownish gray (10YR 6/2) loam; few fine distinct yellowish brown mottles; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; few iron-manganese concretions; medium acid; clear wavy boundary.

C1g—42 to 49 inches; gray (10YR 5/1) silty clay loam; common fine faint pale brown mottles; massive; firm; few fine roots; few fine pores; mildly alkaline; gradual smooth boundary.

C2g—49 to 72 inches; light brownish gray (2.5Y 6/2) clay loam; common medium faint light olive brown (2.5Y 5/4) mottles; massive; firm; mildly alkaline.

The solum is 28 to 60 inches thick. Reaction ranges from medium acid through mildly alkaline.

The A horizon is 4 to 10 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 2 or 3 or value of 5 and chroma of 2 through 4.

The B21 horizon has hue of 10YR, value of 4, and chroma of 3 or 4 or value of 5 and chroma of 3. The B22 horizon has colors similar to those of the B21, or it is mottled in hue of 10YR, value of 5, and chroma of 3 to 8 or value of 6 and chroma of 2. The B23 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2 or hue of 2.5Y, value of 5 or 6, and chroma of 2. The B horizon is loam, silty clay loam, sandy clay loam, or clay loam.

The C horizon has colors similar to those of the B23 horizon. Texture is clay loam, silty clay loam, sandy clay loam, or sandy clay.

Mayhew series

The Mayhew series consists of deep, poorly drained, very slowly permeable, nearly level soils on broad hilltops in areas of the Coastal Plains and the Blackland Prairies. These soils formed in acid, clayey sediment. The native vegetation was mixed pine and hardwood forest. Slopes are 0 to 2 percent.

Mayhew soils are geographically associated with Millwood, Sawyer, and Trebloc soils. Millwood soils occur on a higher landscape, have a redder subsoil, are better drained, and have a very-fine control section. Sawyer soils occur on a slightly higher landscape, have a browner subsoil, are better drained, and have a fine-silty control section. Trebloc soils occur on level to depressed areas and have a fine-silty control section.

Typical pedon of Mayhew silty clay loam, 0 to 2 percent slopes, in a moist pasture area, in the NW1/4NE1/4SE1/4, sec. 18, T. 12 S., R. 24 W.

Ap—0 to 6 inches; grayish brown (10YR 5/2) silty clay loam; common fine faint pale brown and few fine faint gray mottles; moderate medium granular structure; common fine and medium roots; very strongly acid; clear smooth boundary.

B21tg—6 to 25 inches; gray (10YR 5/1) clay; common fine distinct yellowish brown and few fine prominent reddish brown mottles; moderate medium granular structure; common fine and medium roots; very strongly acid; clear smooth boundary.

B22tg—25 to 36 inches; gray (10YR 5/1) clay; common fine distinct yellowish brown and few fine prominent reddish brown mottles; strong medium subangular blocky structure; very firm, sticky and plastic; thick patchy clay films on faces of peds; few slickensides that do not intersect; few fine roots; few fine pores; very strongly acid; clear wavy boundary.

B23tg—36 to 49 inches; gray (10YR 5/1) clay; common fine distinct brown and few fine prominent reddish brown mottles; strong medium subangular blocky structure; very firm, sticky and plastic; thick patchy clay films on faces of peds; few slickensides that do not intersect; very strongly acid; clear wavy boundary.

B24tg—49 to 61 inches; gray (10YR 6/1) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and few fine distinct dark yellowish brown mottles; moderate medium subangular blocky structure; firm; thick patchy clay films on faces of peds; few fine roots; few fine pores; about 2 percent of volume is quartz gravel; very strongly acid; abrupt wavy boundary.

B3g—61 to 72 inches; gray (10YR 6/1) silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) and few fine distinct strong brown mottles; weak medium subangular blocky structure; firm; few shiny faces of peds; few fine pores; few fragments of shale; few iron-manganese concretions; very strongly acid.

The solum is 40 to more than 72 inches thick. Reaction is medium acid to very strongly acid throughout, except where the surface layer has been limed.

The A horizon is 4 to 8 inches thick. It has hue of 10YR or 2.5Y, value of 3, 4, or 5, and chroma of 2.

The B horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2 or hue of 2.5Y, value of 5 or 6, and chroma of 2. Texture is clay, silty clay, or silty clay loam.

McKamie series

The McKamie series consists of deep, well drained, very slowly permeable, gently to moderately sloping soils on Red River terraces. These soils formed in clayey alluvial sediment and occur on side slopes of dissected terraces that parallel the Red River flood plain. The native vegetation was mixed pine and hardwood forest. Slopes are 3 to 12 percent.

McKamie soils are geographically associated with Gore soils. Gore soils are on less dissected terraces, and they have mottles in the subsoil.

Typical pedon of McKamie silty clay loam, 3 to 8 percent slopes, eroded, in a moist wooded area, in the NE1/4SE1/4NW1/4, sec. 26, T. 13 S., R. 26 W.

Ap—0 to 4 inches; brown (10YR 5/3) silty clay loam; common medium faint dark grayish brown (10YR 4/2) and yellowish brown (10YR 5/6) mottles; moderate medium granular structure; very friable; many fine roots; few fine pores; medium acid; clear smooth boundary.

B21t—4 to 19 inches; red (2.5YR 4/6) clay; few fine prominent pale brown mottles; strong medium angular and subangular blocky structure; very firm, sticky and plastic; common thick clay films on surfaces of peds; few pressure faces; common fine roots; few fine pores; medium acid; gradual smooth boundary.

B22t—19 to 29 inches; red (2.5YR 4/6) silty clay; few fine prominent pale brown mottles; strong medium angular and subangular blocky structure; very firm, sticky and plastic; common thick clay films on surfaces of peds; few pressures faces; few fine roots; few fine pores; few soft black concretions; slightly acid; clear smooth boundary.

B23t—29 to 38 inches; red (2.5YR 4/6) clay; few fine prominent pale brown mottles; strong medium angular and subangular blocky structure; very firm, sticky and plastic; common thick clay films on surfaces of peds; few pressure faces; few fine roots; few fine pores; few soft black concretions; mildly alkaline; clear smooth boundary.

B3—38 to 49 inches; yellowish red (5YR 5/6) silt loam with red (2.5YR 4/6) clay pockets; massive; very friable; clay has moderate medium subangular blocky structure and is very firm; few fine roots; few fine pores; moderately alkaline; calcareous; clear smooth boundary.

IIC1—49 to 58 inches; yellowish red (5YR 5/6) silt loam; massive; very friable; few fine roots; few fine pores; strongly alkaline; calcareous; clear smooth boundary.

IIC2—58 to 72 inches; yellowish red (5YR 5/8) very fine sandy loam; massive; very friable; few fine roots; strongly alkaline; calcareous.

The solum is 36 to 60 inches thick. Reaction of the A horizon is medium acid or strongly acid. The B horizon is medium acid to very strongly acid in the upper part and mildly alkaline or moderately alkaline in the lower part. The C horizon is very strongly acid to moderately alkaline. Some pedons are calcareous in the C horizon.

The A horizon is 2 to 8 inches thick. It has hue of 10YR, value of 4, and chroma of 2 or 3, or value of 5 and chroma of 3; or hue of 7.5YR, value of 4 or 5, and chroma of 2 or 4. Texture is fine sandy loam or silty clay loam.

The B horizon has hue of 2.5YR, value of 3, and chroma of 6, or value of 4 and chroma of 6 or 8; or hue of 5YR, value of 4, and chroma of 4, 6, or 8. It has no mottles to common mottles in shades of brown and gray. Texture is clay or silty clay.

The C horizon is stratified clay loam, silty clay loam, silt loam, and very fine sandy loam.

Millwood series

The Millwood series consists of deep, well drained, very slowly permeable, gently sloping soils on hilltops and hillsides in areas of the Coastal Plains and Blackland Prairies. These soils formed in acid clay underlain with chalk or marl. The native vegetation was mixed hardwoods, pines, and prairie grasses. Slopes range from 3 to 8 percent.

Millwood soils are geographically associated with Kipling, Mayhew, Oktibbeha, and Sawyer soils. Kipling soils occur on a slightly lower landscape, have a browner subsoil and thinner sola, and overlie marl and chalk at a shallower depth. Mayhew soils occur on broad ridgetops, have a grayer subsoil, and are more poorly drained. Oktibbeha soils occur on a more dissected landscape and overlie marl and chalk at a shallower depth. Sawyer soils occur on a less dissected landscape and have a browner subsoil and a fine-silty control section.

Typical pedon of Millwood silt loam, 3 to 8 percent slopes, in a moist wooded area, in the SW1/4SE1/4SE1/4, sec. 30, T. 9 S., R. 25 W.

O1—1 to 1/2 inch; pine needles, leaves, and forest debris.

O2—1/2 inch to 0; partially decomposed forest debris.

A1—0 to 7 inches; brown (10YR 5/3) silt loam; few pockets of very dark grayish brown (10YR 3/2) organic stains; moderate fine granular structure; friable; many medium and fine roots; few pebbles; strongly acid; clear smooth boundary.

B21t—7 to 16 inches; red (2.5YR 4/6) clay; few fine prominent pale brown mottles; strong fine angular blocky structure; very firm; sticky and plastic; common thick clay films on faces of peds; few medium and common fine roots; few pebbles; few fine pores; very strongly acid; gradual smooth boundary.

B22t—16 to 44 inches; red (2.5YR 4/6) clay; few fine prominent gray and yellowish brown mottles; strong fine angular and subangular blocky structure; very firm; sticky and plastic; common thick clay films on faces of peds; common fine roots; few fine pores; very strongly acid; gradual smooth boundary.

B23tg—44 to 57 inches; gray (10YR 6/1) clay; common medium prominent yellowish red (5YR 4/8) and few fine distinct brownish yellow mottles; moderate medium angular and subangular blocky structure; very firm; sticky and plastic; common thick clay films on faces of peds; few slickensides that do not intersect; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

B24t—57 to 72 inches; yellowish brown (10YR 5/6) clay; common medium prominent gray (10YR 6/1) and few fine prominent yellowish red mottles; weak medium subangular blocky structure; very firm; sticky and plastic; continuous clay films or pressure faces on peds; few slickensides that do not intersect; few fine pores; very strongly acid.

The solum is 60 to more than 72 inches thick. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed.

The A horizon is 4 to 8 inches thick. The A horizon has hue of 10YR, value of 4, and chroma of 2 or 3 or value of 5 and chroma of 3 or 4.

The upper part of the B horizon has hue of 5YR or 2.5YR, value of 4, and chroma of 6 or 8. It has no mottles to common mottles in shades of brown and gray. The lower part of the B horizon has colors similar to those of the upper part; or it has hue of 10YR, value of 6, and chroma of 1 or 2 or value of 7 and chroma of 1. It has no mottles to common mottles in shades of gray, brown, and red.

Oklared series

The Oklared series consists of deep, well drained, moderately rapidly permeable, nearly level soils on flood plains of the Red River. These soils formed in a loamy, alluvial deposit. The native vegetation was mixed hardwoods. Slopes are 0 to 2 percent.

Oklared soils are geographically associated with Latanier and Sterlington soils. Latanier soils occur further from the stream channel, are more poorly drained, and have a clayey over loamy control section. Sterlington soils occur on slightly higher terraces, have an argillic horizon, and a coarse-silty control section.

Typical pedon of Oklared very fine sandy loam, in a moist field, in the SW1/4NW1/4NW1/4, sec. 33, T. 13 S., R. 26 W.

Ap—0 to 8 inches; yellowish red (5YR 5/6) very fine sandy loam; weak medium granular structure; very friable; mildly alkaline; clear smooth boundary.

C1—8 to 25 inches; reddish yellow (5YR 6/6) very fine sandy loam; few fine prominent yellowish brown mottles; massive; few bedding planes; very friable; mildly alkaline; calcareous; gradual wavy boundary.

C2—25 to 67 inches; yellowish red (5YR 5/6) very fine sandy loam; common medium faint reddish yellow (5YR 6/6) mottles; massive; common bedding planes; very friable; mildly alkaline; calcareous; gradual wavy boundary.

C3—67 to 72 inches; reddish yellow (5YR 6/6) very fine sandy loam; common medium faint yellowish red (5YR 5/6) mottles; massive; common bedding planes; very friable; mildly alkaline; calcareous.

Reaction is mildly alkaline or moderately alkaline throughout. Most pedons are calcareous throughout, but some pedons are noncalcareous in the upper 10 inches.

The A horizon is 5 to 16 inches thick. It has hue of 7.5YR, value of 4, and chroma of 4, or value of 5 and chroma of 4, 6, or 8; or hue of 5YR, value of 4 or 5, and chroma of 3, 4, or 6.

The C horizon has hue of 5YR, value of 4 through 6, and chroma of 4 or 6, or value of 5 and chroma of 8; or hue of 7.5YR, value of 5 or 6, and chroma of 6. The C horizon is dominantly very fine sandy loam or fine sandy loam that has thin strata of finer or coarser material.

Oktibbeha series

The Oktibbeha series consists of moderately deep, moderately well drained, very slowly permeable, gently sloping to rolling soils on hilltops and hillsides in areas of the Blackland Prairies and Coastal Plains. The upper part of these soils formed in acid marine sediment. The lower part formed in residuum of calcareous chalk and marl. The native vegetation was mixed hardwoods and pine. Slopes are 3 to 20 percent.

Oktibbeha soils are associated with Houston, Kipling, Millwood, Saffell, Sumter, and Terouge soils. Houston soils are on a less dissected landscape, have a darker subsoil, and are calcareous throughout. Kipling soils are on a slightly lower landscape, have a browner subsoil, are not so well drained, and are deeper to marl or chalk. Millwood soils are on a less dissected landscape, are acid to a greater depth, and are deeper to marl or chalk. Saffell soils are on a higher landscape, have a loamy-skeletal control section, are more acid and better drained, and do not overlie chalk or marl. Sumter soils are on a more strongly dissected landscape, have a fine-silty, carbonatic control section, are calcareous throughout, and are shallower to chalk. Terouge soils are on flood plains; they are more poorly drained and are alkaline throughout.

Typical pedon of Oktibbeha clay, 8 to 12 percent slopes, eroded, in a moist pasture, in the NE1/4NW1/4NW1/4, sec. 5, T. 11 S., R. 26 W.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) and yellowish red (5YR 5/6) clay; moderate fine granular structure; firm; many roots; medium acid; abrupt smooth boundary.

B21t—4 to 11 inches; red (2.5YR 5/6) clay; strong fine and medium subangular blocky structure; very firm; sticky and plastic; common roots; common fine pores; thick continuous red (2.5YR 4/6) clay films on surfaces of peds; very strongly acid; abrupt wavy boundary.

B22t—11 to 16 inches; red (2.5YR 4/6) clay; common fine prominent light olive brown mottles; strong fine and medium subangular blocky structure; very firm; sticky and plastic; few roots; few fine pores; thick continuous dark red (2.5YR 3/6) clay films on surfaces of peds; common slickensides; very strongly acid; gradual wavy boundary.

B23t—16 to 31 inches; red (2.5YR 4/6) clay; common coarse prominent light brownish gray (10YR 6/2) mottles; strong fine and medium subangular blocky structure; very firm; sticky and plastic; few roots; few fine pores; thick clay films on surfaces of peds; common slickensides; very strongly acid; gradual wavy boundary.

B24t—31 to 36 inches; mottled gray (5Y 6/1) and red (2.5YR 4/6) clay; strong fine and medium subangular blocky structure; very firm; sticky and plastic; few roots; few fine pores; thick clay films on surfaces of peds; common slickensides; very strongly acid; abrupt irregular boundary.

C1—36 to 43 inches; light olive brown (2.5Y 5/6) marly clay; common medium distinct light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/6) mottles; few fine prominent yellowish red mottles; massive; firm; sticky and plastic; mildly alkaline; calcareous; abrupt irregular boundary.

Cr—43 to 45 inches; soft, rippable chalk; massive.

The solum is 20 to 50 inches thick. The A and B horizons range from very strongly acid to slightly acid, except where the surface layer has been limed. The C horizon ranges from neutral to moderately alkaline, and it generally is calcareous.

The A horizon is 2 to 6 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 2 or 3, or hue of 10YR, value of 5, and chroma of 3. Because of erosion and mixing of the B horizon by plowing, the Ap horizon is yellowish red or red. Texture is fine sandy loam, silty clay loam, or clay.

The B21t, B22t, and B23t horizons have hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. The B23t horizon has no mottles in some places; in other places, mottles in shades of gray and brown are common. The B24t has colors similar to those of the B23t horizon, but in some pedons the matrix has hue of 5Y, value of 6, and chroma of 1.

The C horizon has hue of 2.5Y, value of 5, and chroma of 4 or 6, or value of 6 and chroma of 4; or hue of 10YR, value of 5 or 6, and chroma of 8. There are common to many mottles in shades of gray, brown, olive, and yellow. Texture is marly clay or chalk.

Ora series

The Ora series consists of deep, moderately well drained, moderately to moderately slowly permeable, gently sloping soils that formed in thick beds of loamy marine sediment. These soils are on hilltops and hillsides of the Coastal Plains. The native vegetation was mixed pines and hardwoods. Slopes are from 3 to 8 percent.

Ora soils are geographically associated with Ruston, Sacul, and Saffell soils. Ruston soils are on a lower landscape and are better drained and do not have fragipans. Sacul soils are on a higher more dissected landscape, have clayey control sections, and do not have fragipans. Saffell soils are on higher landscapes, have loamy-skeletal control sections, and are better drained and do not have fragipans.

Typical pedon of Ora fine sandy loam, 3 to 8 percent slopes, in a moist idle area, in the SE1/4SE1/4NE1/4, sec. 24, T. 14 S., R. 24 W.

Ap—0 to 8 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

B21t—8 to 19 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; friable; patchy thin clay films on faces of peds; common fine roots; few fine pores; few rounded pebbles up to 1/4 inch in diameter; strongly acid; gradual smooth boundary.

B22t—19 to 28 inches; yellowish red (5YR 5/6) loam; moderate medium subangular blocky structure; firm; patchy thin clay films on faces of peds; few fine roots; common fine pores; few black pebbles up to 1/4 inch in diameter; strongly acid; abrupt smooth boundary.

Bx1—28 to 45 inches; yellowish red (5YR 5/8) loam; common medium prominent yellowish brown (10YR 5/6) and common fine prominent gray mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky structure; firm; about 80 percent of horizon is brittle; patchy thin clay films on faces of peds; some prisms coated with silt loam; few fine roots in upper part along faces of prisms; common fine and few medium pores; few black pebbles; few rounded pebbles up to 1/2 inch in diameter; very strongly acid; clear smooth boundary.

Bx2—45 to 58 inches; yellowish brown (10YR 5/6) sandy loam; common medium prominent red (2.5YR 4/6) and gray (10YR 6/1) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky structure; firm; brittle; patchy thin clay films on faces of peds; clay films in pores; common fine and medium pores; few pebbles up to 1/4 inch in diameter; about 1 percent of volume is plinthite; very strongly acid, clear smooth boundary.

Bx3—58 to 72 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent red (2.5YR 4/6) and gray (10YR 6/1) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky structure; firm; brittle; patchy thin clay films on faces of peds; clay films in pores; common fine and medium pores; few pebbles up to 1/4 inch in diameter; about 1 percent of volume is plinthite; very strongly acid.

The solum is more than 60 inches thick. Depth to the fragipan ranges from 20 to 40 inches. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed.

The A horizon is 4 to 10 inches thick. The A1 or Ap horizon has hue of 10YR, value of 4, and chroma of 2 or value of 5 and chroma of 3 or 4. If present, the A2 horizon has hue of 10YR, value of 5, and chroma of 2.

The B2t and Bx horizons have hue of 5YR, value of 4 or 5, and chroma of 4, 6, or 8 or hue of 2.5YR, value of 4, and chroma of 4, 6, or 8. The Bx horizon is mottled in shades of yellow, brown, gray, and red. The B2t and Bx horizons are clay loam, sandy clay loam, loam, silt loam, or fine sandy loam.

Ouachita series

The Ouachita series consists of deep, well drained, moderately slowly permeable, level soils on flood plains. These soils formed in thick beds of loamy alluvium on natural levees of streams that drain the Ouachita Mountains and Coastal Plains. The native vegetation was mixed hardwoods that included few pines. Slopes are 0 to 1 percent.

The Ouachita soils are geographically associated with the Guyton and Sardis soils. Guyton soils occur in depressions, have a grayer subsoil, have argillic horizons, and are poorly drained. Sardis soils occur on a slightly lower landscape, have a grayer subsoil, and are not as well drained.

Typical pedon of Ouachita silt loam in a moist soybean field, in the NE1/4NE1/4NE1/4, sec. 26, T. 9 S., R. 24 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; few fine faint pale brown mottles; moderate fine granular structure; very friable; few fine and medium roots; strongly acid; clear smooth boundary.

A12—7 to 19 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; strongly acid; gradual smooth boundary.

B21—19 to 34 inches; brown (10YR 4/3) silt loam; moderate medium subangular blocky structure; friable; few fine pores; few fine dark brown concretions; strongly acid; gradual smooth boundary.

B22—34 to 48 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint mottles of pale brown and light brownish gray; moderate medium subangular blocky structure; friable; few fine pores; few fine dark brown concretions; strongly acid; clear wavy boundary.

B23—48 to 58 inches; yellowish brown (10YR 5/4) silt loam; few fine faint pale brown mottles; weak fine subangular blocky structure; very friable; strongly acid; gradual smooth boundary.

C—58 to 72 inches; yellowish brown (10YR 5/4) silt loam; massive; very friable; very strongly acid.

The solum is 40 to more than 72 inches thick. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed.

The A horizon is 6 to 21 inches thick. It has hue of 10YR, value of 4, and chroma of 2 through 4 or value of 5 and chroma of 3.

The B horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4 or value of 6 and chroma of 3. It has no mottles to common mottles in shades of brown and gray below 24 inches. Texture is silt loam, loam, or silty clay loam.

The C horizon has colors similar to those of the B horizon. Texture is silt loam, fine sandy loam, or loamy fine sand.

Perry series

The Perry series consists of deep, poorly drained, very slowly permeable, level soils on flood plains of the Red River. These soils formed in clayey slack water sediment. They have a seasonal high water table late in winter and early in spring. The native vegetation was mixed hardwoods. Slopes are 0 to 1 percent.

Perry soils are geographically associated with Desha and Portland soils. Desha soils are on a slightly higher landscape, have mollic epipedons, and have a redder subsoil. Portland soils are on a higher landscape, have a browner upper subsoil, and are better drained.

Typical pedon of Perry clay in a moist wooded area, in the NE1/4SW1/4NE1/4, sec. 2, T. 13 S., R. 27 W.

O1—1/2 inch to 0; leaves and forest debris.

A11g—0 to 7 inches; dark gray (10YR 4/1) clay; few fine faint brown mottles; moderate medium subangular blocky structure; firm; sticky and plastic; common fine and medium roots; strongly acid; gradual smooth boundary.

B21g—7 to 22 inches; dark gray (10YR 4/1) clay; common fine faint dark grayish brown mottles; moderate medium subangular blocky structure; very firm; sticky and plastic; many slickensides; common fine and medium roots; strongly acid; clear smooth boundary.

B22g—22 to 35 inches; dark gray (10YR 4/1) clay; few fine faint dark brown and common medium prominent dark reddish brown (5YR 3/4) mottles; strong medium subangular blocky structure; very firm; sticky and plastic; many slickensides; few fine roots; few fine pores; slightly acid; clear wavy boundary.

IIB3—35 to 53 inches; dark reddish brown (5YR 3/4) clay; few fine prominent dark grayish brown mottles; strong medium subangular blocky structure; very firm; sticky and plastic; many slickensides; few fine roots; few fine pores; mildly alkaline; calcareous; gradual wavy boundary.

IIC1—53 to 63 inches; reddish brown (5YR 4/4) clay; few fine prominent dark grayish brown mottles; weak medium subangular blocky structure; very firm; sticky and plastic; many slickensides; few fine roots; few fine pores; few carbonate concretions; moderately alkaline; calcareous.

IIC2—63 to 72 inches; reddish brown (5YR 4/4) clay; few fine prominent dark grayish brown mottles; weak medium subangular blocky structure; very firm; sticky and plastic; many slickensides; few fine roots; few fine pores; few carbonate concretions; mildly alkaline; calcareous.

The solum is 30 to 60 inches thick. Depth to the IIB horizon is 14 to 36 inches. The reaction is strongly acid to slightly acid in the A and B horizons, except where the surface layer has been limed. Reaction of the IIB and IIC horizons is neutral to moderately alkaline, and these horizons generally are calcareous.

The A horizon is 4 to 9 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 1 or 2.

The B horizon has hue of 10YR, value of 4 or 5, and chroma of 1. Few to many mottles are in shades of red and brown.

The IIB horizon has hue of 5YR, value of 3 or 4, and chroma of 4. Few to many mottles are in shades of red, gray, and brown.

The IIC horizon has hue of 5YR, value of 4 or 5, and chroma of 4. It contains few to many fine to coarse carbonate concretions.

Portland series

The Portland series consists of deep, somewhat poorly drained, very slowly permeable, level soils on flood plains of the Red River. These soils formed in clayey slack water sediment. They have a seasonal high water table late in winter and early in spring. Slopes are 0 to 1 percent.

Portland soils are geographically associated with Desha and Perry soils. Desha soils are on a slightly higher landscape, have mollic epipedons, and have a redder subsoil. Perry soils are in depressions; they are grayer in the upper part of the subsoil and are more poorly drained.

Typical pedon of Portland clay, in a moist wooded area, in the NE1/4NE1/4NE1/4, sec. 2, T. 13 S., R. 27 W.

O1—1/2 to 1/4 inch; leaves and forest debris.

O2—1/4 inch to 0; partially decomposed forest debris.

A11—0 to 7 inches; dark grayish brown (10YR 4/2) clay; few fine prominent reddish brown mottles; moderate medium subangular blocky structure; firm; sticky and plastic; many medium and fine roots; strongly acid; clear smooth boundary.

A12—7 to 15 inches; dark grayish brown (10YR 4/2) clay; common medium prominent dark reddish brown (5YR 3/4) mottles and few fine faint dark gray mottles; strong medium subangular blocky structure; very firm; sticky and plastic; many slickensides; few medium and many fine roots; strongly acid; clear smooth boundary.

B21—15 to 31 inches; reddish brown (5YR 4/3) clay; few fine prominent dark grayish brown mottles; strong medium subangular blocky structure; very firm; sticky and plastic; many slickensides; few fine roots; few fine pores; slightly acid; gradual wavy boundary.

B22—31 to 45 inches; reddish brown (5YR 4/3) clay; common fine faint light reddish brown mottles; strong medium subangular blocky structure; very firm; sticky and plastic; many slickensides; few fine roots; few fine pores; few carbonate concretions; moderately alkaline; calcareous; gradual smooth boundary.

B23—45 to 57 inches; reddish brown (5YR 4/3) clay; common fine faint light reddish brown mottles; strong medium subangular blocky structure; very firm; sticky and plastic; many slickensides; few fine roots; few fine pores; few carbonate concretions; moderately alkaline; calcareous; gradual wavy boundary.

B24—57 to 72 inches; reddish brown (5YR 4/3) clay; few fine prominent dark grayish brown mottles; moderate medium subangular blocky structure; very firm; sticky and plastic; few slickensides; few fine roots; few fine pores; few carbonate concretions; moderately alkaline; calcareous.

The solum is 38 to 72 inches or more thick. The A horizon is strongly acid or very strongly acid, except where the surface layer has been limed. The B horizon ranges from slightly acid to moderately alkaline. Calcareous concretions at a depth below 30 inches range from none to common.

The A horizon is 5 to 17 inches thick. The A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or hue of 7.5YR and 10YR, value of 3 or 4, and chroma of 2. Where the value and chroma are 3 or less, the A horizon is less than 10 inches deep.

The B horizon has hue of 5YR, value of 4, and chroma of 4 or hue of 5YR, value of 4, and chroma of 3. The upper part of the B horizon has few to common mottles that have chroma of 2 or less. Texture is clay or silty clay.

If present, the C horizon has colors similar to those of the B horizon.

Ruston series

The Ruston series consists of deep, well drained, moderately permeable, nearly level soils on stream terraces and ridgetops. These soils formed in thick beds of loamy, marine or alluvial sediment in the Coastal Plains. The native vegetation was mixed pines and hardwoods. Slopes are 1 to 3 percent.

Ruston soils are geographically associated with Harleston and Ora soils. Harleston soils occur on a slightly lower landscape, have a browner subsoil, and have a coarse-loamy control section. Ora soils occur on slightly steeper slopes, are not as well drained, and have a fragipan.

Typical pedon of Ruston fine sandy loam, 1 to 3 percent slopes, in a moist meadow, in the NW1/4SE1/4SW1/4, sec. 28, T. 9 S., R. 23 W.

Ap—0 to 5 inches; yellowish brown (10YR 5/4) fine sandy loam, moderate medium granular structure; very friable; many fine and medium roots; slightly acid; clear smooth boundary.

A1—5 to 9 inches; dark brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; few quartz gravel; slightly acid; clear smooth boundary.

B21t—9 to 42 inches; yellowish red (5YR 5/8) sandy clay loam; strong medium and fine subangular blocky structure; friable; thin patchy clay films on faces of peds; few fine roots; common fine pores; very strongly acid; clear wavy boundary.

B&A'2—42 to 48 inches; yellowish red (5YR 5/8) fine sandy loam; 1/2 to 1 inch wide pockets and streaks of light yellowish brown fine sandy loam and a few fine faint red mottles; weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; few fine roots; few fine pores; very strongly acid; clear smooth boundary.

B'21t—48 to 67 inches; yellowish red (5YR 5/8) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; few fine prominent light brownish gray and few fine faint red mottles; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of peds; few fine roots; few fine pores; few quartz gravel; very strongly acid; clear wavy boundary.

B'22t—67 to 87 inches; yellowish red (5YR 5/6) sandy clay loam; common fine prominent yellowish brown and light brownish gray and few fine faint red mottles; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; few quartz gravel; very strongly acid.

C—87 to 98 inches; strong brown (7.5YR 5/8) fine sandy loam; massive; very friable; strongly acid.

The solum is 60 to 80 inches or more thick. Reaction is slightly acid to strongly acid in the A horizon, except where the surface layer has been limed. The B and C horizons are medium acid to very strongly acid.

The A horizon is 7 to 15 inches thick. The A1 or Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3 or value of 5 and chroma of 3 or 4. If present, the A2 horizon has hue of 10YR, value of 6, and chroma of 2 or 3.

The B horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8 or hue of 5YR, value of 4, and chroma of 4. The B't horizon has few to common mottles in shades of yellow, brown, and gray. Texture is fine sandy loam or sandy clay loam.

Sacul series

The Sacul series consists of deep, moderately well drained, slowly permeable, gently sloping to rolling soils that formed in clayey marine sediment. These soils are on hilltops and hillsides of the Coastal Plains. The native vegetation was pines and mixed hardwoods. Slopes are 3 to 20 percent.

Sacul soils are geographically associated with Kirvin, Ora, Saffell, Sawyer, and Smithdale soils. Kirvin soils are on slightly higher landscapes, are better drained, and have more ironstone and sandstone fragments. Ora soils are on a lower landscape, have a fine-loamy control section, and have a fragipan. Saffell soils are on higher hilltops and have a loamy-skeletal control section. Sawyer soils are on a lower, less dissected landscape, have a browner subsoil, and have a fine-silty control section. Smithdale soils are on a less dissected landscape, are better drained, and have a fine-loamy control section.

Typical pedon of Sacul fine sandy loam, 3 to 8 percent slopes, in a moist wooded area, in the SE1/4SW1/4SW1/4, sec. 31, T. 13 S., R. 23 W.

O1—1 1/2 inches to 1/2 inch; pine needles and forest debris.

O2—1/2 inch to 0; partially decomposed forest debris.

A1—0 to 5 inches; brown (10YR 5/3) fine sandy loam; common medium faint dark grayish brown (10YR 4/2) mottles; moderate medium granular structure; very friable; many medium and fine roots; 1 percent by volume rounded gravel; medium acid; clear smooth boundary.

B21t—5 to 14 inches; yellowish red (5YR 4/8) clay; strong medium angular and subangular blocky structure; firm; many thick clay films on surfaces of peds; clay films in pores; many fine roots; few fine pores; 1 percent by volume rounded gravel; strongly acid; clear smooth boundary.

B22t—14 to 22 inches; red (2.5YR 4/6) clay; common fine prominent yellowish brown mottles; strong medium subangular blocky structure; firm; many thick clay films on surfaces of peds; clay films in pores; many fine roots; few fine pores; very strongly acid; gradual smooth boundary.

B23t—22 to 36 inches; mottled gray (10YR 6/1), red (2.5YR 4/8), and yellowish brown (10YR 5/6) silty clay; moderate medium subangular blocky structure; firm; few thick and many thin clay films on surfaces of peds; clay films in pores; very strongly acid; clear smooth boundary.

B24t—36 to 51 inches; mottled gray (10YR 6/1), red (2.5YR 4/8), and yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few thick and many thin clay films on surfaces of peds; clay films in pores; few fine roots; few fine pores; very strongly acid; clear smooth boundary.

B3—51 to 72 inches; mottled gray (10YR 6/1) and yellowish brown (10YR 5/8) silty clay; few relict fragments of shale; weak medium subangular blocky structure; firm; some peds have shiny surfaces; few fine roots; few fine pores; very strongly acid.

The solum is 40 to more than 72 inches thick. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed.

The A horizon is 4 to 8 inches thick. The A1 or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. If present, the A2 horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4.

The B21t and B22t horizons have hue of 5YR or 2.5YR, value of 3 to 5, and chroma of 6 or 8. The B21t and B22t horizons are clay or silty clay; the B23t, B24t, and B3 horizons are silty clay loam, clay loam, sandy clay loam, or silt loam. The lower B horizon is mottled in shades of gray and brown.

Saffell series

The Saffell series consists of deep, well drained, moderately permeable, gently sloping to rolling soils on narrow hilltops and hillsides of the Coastal Plains. These soils formed in thick beds of gravelly marine sediment. The native vegetation was mixed pine and hardwoods. Slopes are 3 to 20 percent.

Saffell soils are associated with Bowie, Oktibbeha, Ora, and Sacul soils. Bowie soils occur on a slightly lower landscape and have a fine-loamy control section. Oktibbeha soils occur on a lower landscape, have a very-fine control section, and are moderately deep to chalk or marl. Ora soils occur on a lower, less dissected landscape, have a fine-loamy control section, and have a fragipan. Sacul soils occur on a more dissected landscape, are more poorly drained, and have a clayey control section.

Typical pedon of Saffell gravelly fine sandy loam, 3 to 8 percent slopes, in a moist wooded area, in the SW1/4NE1/4NW1/4, sec. 16, T. 10 S., R. 24 W.

Ap—0 to 6 inches; brown (10YR 5/3) gravelly fine sandy loam; weak medium granular structure; very friable; about 20 percent by volume rounded gravel; strongly acid; abrupt smooth boundary.

B21t—6 to 33 inches; yellowish red (5YR 5/8) very gravelly sandy clay loam; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of many peds; about 50 percent by volume rounded gravel; very strongly acid; gradual smooth boundary.

B22t—33 to 48 inches; yellowish red (5YR 5/8) very gravelly sandy clay loam; moderate medium subangular blocky structure; firm; thin patchy clay films on faces of many peds; about 60 percent by volume rounded gravel; very strongly acid.

C—48 to 72 inches; strong brown (7.5YR 5/6) very gravelly sandy loam; massive; firm; about 70 percent by volume rounded gravel; very strongly acid.

The solum is 35 to 60 inches thick. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed.

The A horizon is 4 to 8 inches thick. It has hue of 10YR, value of 4, and chroma of 2 or 3 or value of 5 and chroma of 3 or 4; or hue of 7.5YR, value of 4 or 5, and chroma of 2 or 4. The gravel content of the A horizon ranges from 15 to 25 percent.

If present, the B1 horizon has hue of 10YR, value of 5, and chroma of 4 or 6; or hue of 7.5YR, value of 4, and chroma of 4, or value of 5 and chroma of 6. Texture is gravelly or very gravelly fine sandy loam or gravelly or very gravelly sandy clay loam. The B2t and B3 horizons have hue of 7.5YR, value of 5, and chroma of 6 or 8 or hue of 5YR, value of 4 or 5, and chroma of 4, 6, or 8. Texture is gravelly or very gravelly sandy clay loam, gravelly or very gravelly loam, or gravelly or very gravelly fine sandy loam. Gravel content of the B horizon is 35 to 65 percent by volume.

The C horizon has colors similar to those of the B3 horizon. Texture is gravelly or very gravelly sandy loam. Gravel content of the C horizon is 20 to 80 percent by volume.

Sardis series

The Sardis series consists of deep, somewhat poorly drained, moderately permeable, nearly level soils that formed in alluvial sediment. These soils are on flood plains of the Coastal Plains. These soils have a seasonal high water table late in winter and early in spring. The native vegetation was predominantly mixed hardwoods and some pine. Slopes range from 0 to 3 percent.

Sardis soils are geographically associated with Guyton, Ouachita, and Smithton soils. Guyton soils occur in depressions, have a grayer subsoil, and are poorly drained. Ouachita soils occur at a higher elevation, have a browner subsoil, and are better drained. The Smithton soils occur in level areas on adjacent uplands, have a grayer subsoil, are more poorly drained, and have a coarse-loamy control section.

Typical pedon of Sardis silt loam, occasionally flooded, in a moist soybean field, in the NE1/4NW1/4SE1/4, sec. 26, T. 9 S., R. 24 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; few fine and medium roots; many fine pores; few fine dark brown concretions; medium acid; abrupt smooth boundary.

B21—7 to 12 inches; brown (10YR 5/3) silt loam; few fine dark brown stains; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few fine dark brown concretions; very strongly acid; clear smooth boundary.

B22—12 to 26 inches; brown (10YR 5/3) silt loam; common fine distinct light brownish gray mottles; moderate medium subangular structure; friable; few fine roots; few fine pores; few fine dark brown concretions; very strongly acid; clear smooth boundary.

B23—26 to 41 inches; yellowish brown (10YR 5/6) silt loam; common fine distinct gray and brown mottles; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; few fine dark brown concretions; very strongly acid; gradual wavy boundary.

B24—41 to 56 inches; yellowish brown (10YR 5/6) silt loam; common fine faint pale brown and common medium distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; few fine dark brown concretions; very strongly acid; gradual smooth boundary.

C—56 to 72 inches; gray (10YR 6/1) loam; common medium distinct yellowish brown (10YR 5/6) and few fine distinct dark brown mottles; massive; few fine pores; few fine dark brown concretions; very strongly acid.

The solum is 40 to 70 inches thick. Reaction ranges from medium acid to very strongly acid throughout, except where the surface layer has been limed.

The A horizon is 5 to 8 inches thick. The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4.

The B horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 through 8. Few to common gray and brown mottles occur at a depth of 8 to 24 inches. Texture is silt loam, silty clay loam, or clay loam.

The C horizon has colors that range from a gray matrix with mottles in shades of brown to a yellowish brown or dark yellowish brown matrix with mottles in shades of gray. Texture is silt loam or sandy loam.

Savannah series

The Savannah series consists of deep, moderately well drained, moderately to moderately slowly permeable, nearly level to gently sloping soils that formed in thick beds of loamy, marine sediment. These soils are on broad ridgetops and side slopes of the Coastal Plains. The native vegetation was mixed pine and hardwoods. Slopes are 1 to 8 percent.

Savannah soils are geographically associated with Bowie, Ora, Sawyer, and Smithdale soils. Bowie soils are on a slightly higher landscape, have more plinthite in the subsoil, and do not have a fragipan. Ora soils are on slightly higher ridges and have a redder subsoil. Sawyer soils are on a slightly lower landscape, have a fine-silty control section, do not have a fragipan, and have a clayey lower subsoil. Smithdale soils occur on a more dissected landscape, have a redder subsoil, are better drained, and do not have a fragipan.

Typical pedon of Savannah fine sandy loam, 3 to 8 percent slopes, in a moist idle area, in the NE1/4-NW1/4NE1/4, sec. 13, T. 14 S., R. 24 W.

Ap—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

A21—3 to 9 inches; brown (10YR 5/3) fine sandy loam; weak fine subangular blocky structure; friable; common fine roots; few fine pores; strongly acid; clear smooth boundary.

A22&B1—9 to 15 inches; mixed brown (10YR 5/3) and yellowish brown (10YR 5/6) loam; weak fine and moderate medium subangular blocky structure; friable; common fine roots; few fine pores; strongly acid; gradual wavy boundary.

B2t—15 to 25 inches; yellowish brown (10YR 5/8) clay loam; moderate medium subangular blocky structure; firm; patchy thin clay films on most faces of peds; common fine roots; few fine pores; few rounded pebbles up to one-half inch in diameter; firm; strongly acid; gradual wavy boundary.

Bx1—25 to 36 inches; mottled red (2.5YR 4/8), yellowish brown (10YR 5/6), and grayish brown (10YR 5/2) sandy clay loam; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; brittle; about 75 percent of horizon is brittle; prisms coated with fine sandy loam; thin patchy clay films on some faces of peds; few fine roots along faces of prisms; common fine vesicular pores; few rounded pebbles up to one-half inch in diameter; very strongly acid; gradual smooth boundary.

Bx2—36 to 47 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent red (2.5YR 4/8) and common medium distinct gray (10YR 6/1) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; brittle; patchy thin clay films on faces of peds; few fine roots along faces of prisms; common fine vesicular pores; very fine sandy loam coating on prisms; very strongly acid; clear smooth boundary.

Bx3—47 to 72 inches; mottled red (2.5YR 5/8) and yellowish brown (10YR 5/6) fine sandy loam; moderate coarse prismatic structure parting to moderate medium subangular blocky; prisms coated with gray (10YR 6/1) loam about 1/2 inch thick; massive; patchy thin clay films on faces of peds; firm; common fine vesicular pores; few pebbles up to 1/4 inch in diameter; very strongly acid.

The solum is 60 to more than 80 inches thick. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Depth to the fragipan ranges from 20 to 38 inches.

The A horizon is 7 to 12 inches thick. The A1 horizon has hue of 10YR, value of 3, and chroma of 1 or 2. The Ap and A2 horizons have hue of 10YR, value of 4, and chroma of 2, or value of 5 and chroma of 3 or 4, or value of 6 and chroma of 3.

The Bt horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8 or it has hue of 7.5YR, value of 5, and chroma of 6 or 8. The Bx horizon is mottled yellow, brown, red, and gray, or it is yellowish brown mottled with gray. The Bt and Bx horizons are fine sandy loam, sandy clay loam, clay loam, or loam.

Sawyer series

The Sawyer series consists of deep, moderately well drained, slowly permeable, nearly level to gently sloping soils that formed in thick beds of loamy and clayey, marine sediment. These soils occur on hilltops and hillsides of the Coastal Plains. Slopes are 1 to 8 percent.

Sawyer soils are geographically associated with Mayhew, Millwood, Sacul, Savannah, and Trebloc soils. Mayhew soils occur on a smooth level landscape, are more poorly drained, have a grayer subsoil, and have a clayey control section. Millwood soils occur on a higher landscape, are better drained, have a redder subsoil, and have a very-fine control section. Sacul soils occur on a higher more dissected landscape, have a redder subsoil, and have a clayey control section. Savannah soils occur on a slightly higher landscape, have a fragipan, and contain less clay in the lower subsoil. Trebloc soils occur in depressions, are more poorly drained, and have a grayer subsoil.

Typical pedon of Sawyer loam, 3 to 8 percent slopes, in a moist wooded area, in the SE1/4SE1/4NE1/4, sec. 11, T. 10 S., R. 25 W.

O1—1 to 1/2 inch; pine needles and forest debris.

O2—1/2inch to 0; partially decomposed forest debris.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam; moderate medium granular structure; friable; many fine and medium roots; medium acid; clear smooth boundary.

B21t—6 to 19 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common thin patchy clay films on faces of peds; few fine roots; few fine dark brown concretions; strongly acid; gradual wavy boundary.

B22t—19 to 29 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and few fine prominent red mottles; moderate medium subangular blocky structure; friable; common thin patchy clay films on faces of peds; few fine roots; few fine pores; few fine dark brown concretions; very strongly acid; abrupt wavy boundary.

B23t—29 to 54 inches; mottled red (2.5YR 4/6), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/6) silty clay; some peds in the upper 2 inches of this horizon have a thin coating of gray (10YR 6/1) silt loam; strong medium angular and subangular blocky structure; firm; sticky and plastic; thick patchy clay films on faces of peds; few fine roots; few fine pores; few fine dark brown concretions; very strongly acid; gradual wavy boundary.

B24t—54 to 72 inches; mottled gray (10YR 6/1), yellowish brown (10YR 5/6), and red (2.5YR 5/6) silty clay; moderate medium angular and subangular blocky structure; firm; sticky and plastic; thick patchy clay films on faces of peds; few fine roots; few fine pores; few fine dark brown concretions; very strongly acid.

The solum is 60 to 80 inches or more thick. Reaction is very strongly acid or strongly acid except where the surface layer has been limed.

The A horizon ranges from 4 to 10 inches in thickness. The A1 or Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3 or value of 5 and chroma of 3. If present, the A2 horizon has hue of 10YR, value of 5, and chroma of 2 or 3.

The B21t and B22t horizons have hue of 10YR, value of 5, and chroma of 4, 6, or 8 or hue of 7.5YR, value of 5, and chroma of 6 or 8. Grayish mottles are few to common. The B21t and B22t horizons are silt loam, loam, silty clay loam, or clay loam. The B23t and B24t horizons are mottled red, gray, and yellowish brown, and any one of these colors is dominant. The B23t and B24t horizons are silty clay or clay.

Smithdale series

The Smithdale series consists of deep, well drained, moderately permeable, gently sloping soils that formed in thick beds of loamy, marine sediment. Smithdale soils are on ridgetops and side slopes of the Coastal Plains. The native vegetation was mixed pine and hardwoods. Slopes are 3 to 8 percent.

Smithdale soils are geographically associated with Alaga, Briley, Sacul, and Savannah soils. Alaga soils are on a slightly higher landscape, are browner, do not have argillic horizons, and are sandier throughout. Briley soils occur on a slightly higher landscape and have a thick sandy surface layer. Sacul soils occur on a more dissected landscape, are less well drained, and have a clayey control section. Savannah soils occur on a slightly lower landscape, are browner, and have a fragipan.

Typical pedon of Smithdale fine sandy loam, 3 to 8 percent slopes, in a moist meadow, in the SE1/4SW1/4SE1/4, sec. 20, T. 14 S., R. 23 W.

Ap—0 to 7 inches; brown (10YR 5/3) fine sandy loam; moderate medium angular blocky structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

A2—7 to 13 inches; yellowish brown (10YR 5/6) loam; common fine faint strong brown and few fine faint brown mottles; weak medium subangular blocky structure; very friable; many fine roots; medium acid; clear smooth boundary.

B21t—13 to 23 inches; yellowish red (5YR 4/8) loam; moderate medium subangular blocky structure; friable; common thin clay films in pores; few fine roots; few worm holes; common fine pores; medium acid; gradual smooth boundary.

B22t—23 to 37 inches; red (2.5YR 4/8) loam; moderate medium subangular blocky structure; friable; common thin clay films on faces of peds and few clay films in pores; few worm holes; few fine pores; few fine roots; strongly acid; gradual smooth boundary.

B23t—37 to 52 inches; red (2.5YR 4/8) loam; moderate medium subangular blocky structure; friable; common thin clay films on faces of peds and few clay films in pores; few light yellowish brown streaks; few worm holes; few fine pores; few fine roots; strongly acid; gradual smooth boundary.

B24t—52 to 61 inches; red (2.5YR 4/8) loam; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; common pockets and streaks of uncoated sand grains; few fine pores; few fine roots; common yellowish brown streaks; strongly acid; gradual smooth boundary.

B25t—61 to 72 inches; red (2.5YR 4/8) loam; few medium prominent pale brown (10YR 6/3) coatings on vertical faces of peds; common fine prominent yellowish brown mottles; moderate medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; few pockets and streaks of uncoated sand grains; few fine pores; few fine roots; strongly acid.

The solum is 60 to more than 72 inches thick. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed.

The A horizon is 4 to 18 inches thick. The A1 horizon has hue of 10YR, value of 3, and chroma of 3 or value of 4 and chroma of 2 or 3. The Ap or A2 horizon has hue of 10YR, value of 4, and chroma of 3, or value of 5 and chroma of 2, or value of 5 or 6 and chroma of 3 or 4, or value of 5 and chroma of 6.

The upper part of the Bt horizon has hue of 5YR or 2.5YR, value of 4, and chroma of 6 or 8; or it has hue of 5YR, value of 5, and chroma of 6. Texture is clay loam, sandy clay loam, or loam. The lower Bt horizon has colors similar to those of the upper Bt horizon except that few to many pockets of uncoated sand grains are present. Texture is loam or sandy clay loam. Gravel content ranges from 0 to 10 percent throughout.

Smithton series

The Smithton series consists of deep, poorly drained, moderately slowly permeable, level soils on upland flats and stream terraces of the Coastal Plains. These soils formed in sandy, marine and alluvial sediment. They have a seasonal high water table during the winter and spring months. Slopes are 0 to 1 percent.

Smithton soils are geographically associated with Guyton, Harleston, and Sardis soils. Guyton soils occur on adjacent flood plains and have a fine-silty control section. Harleston soils occur on a higher, more sloping landscape, are browner, and are better drained. Sardis soils occur on adjacent flood plains, have a fine-silty control section, and are better drained.

Typical pedon of Smithton fine sandy loam, in a moist forest area, in the SW1/4NW1/4SE1/4, sec. 5, T. 14 S., R. 23 W.

O1—1 to 1/2 inch; pine needles, oak leaves, and forest debris.

O2—1/2 inch to 0; partially decomposed forest debris.

A1—0 to 7 inches; grayish brown (10YR 5/2) fine sandy loam; common fine distinct yellowish brown mottles and common fine faint gray mottles; moderate medium granular structure; friable; many medium and fine roots; few fine black concretions; very strongly acid; clear smooth boundary.

B1g—7 to 21 inches; gray (10YR 6/1) loam; common coarse distinct yellowish brown (10YR 5/4) mottles and few fine dark brown mottles; weak medium subangular blocky structure; friable; many fine roots; few fine pores; few fine black concretions; very strongly acid; clear irregular boundary.

B21tg—21 to 35 inches; gray (10YR 5/1) loam; few 1/2 to 2 inch wide gray (10YR 6/1) tongues of fine sandy loam; common coarse distinct yellowish brown (10YR 5/6) and few fine distinct dark brown mottles; weak medium subangular blocky structure; friable; common thin clay films on faces of peds; clay films in pores; sand grains are coated and bridged; few fine roots; few fine pores; few fine black concretions; very strongly acid; gradual smooth boundary.

B22tg—35 to 49 inches; gray (10YR 6/1) loam; common medium distinct yellowish brown (10YR 5/8), common fine distinct light yellowish brown and few fine distinct dark brown mottles; moderate medium subangular blocky structure; firm; common thin clay films in pores; sand grains coated and bridged; few fine roots; few fine pores; few fine black concretions; strongly acid; gradual wavy boundary.

B23tg—49 to 61 inches; gray (10YR 5/1) loam; common coarse distinct yellowish brown (10YR 5/8) and common fine distinct brownish yellow and dark gray mottles; moderate medium subangular blocky structure; firm; common thin clay films on faces of peds; clay films in pores; few fine roots; few fine pores; few fine black concretions; strongly acid.

B24tg—61 to 72 inches; gray (10YR 5/1) clay loam; common coarse distinct yellowish brown (10YR 5/8) and common fine distinct brownish yellow and dark gray mottles; moderate medium subangular blocky structure; firm; common thin clay films on faces of peds; clay films in pores; few fine roots; few fine pores; few fine black concretions; strongly acid.

The solum is more than 60 inches thick. Reaction is very strongly acid or strongly acid throughout, except where the surface layer has been limed.

The A horizon ranges from 6 to 15 inches in thickness. The A1 or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2. If present, the A2 horizon has hue of 10YR, value of 5, and chroma of 1 or 2 or value of 6 and chroma of 2.

The B horizons have hue of 10YR, value of 5, and chroma of 1, or value of 6 and chroma of 1 or 2. Common to many mottles are in shades of brown. Texture is fine sandy loam or loam.

Sterlington series

The Sterlington series consists of deep, well drained, moderately permeable, nearly level soils on low terraces and natural levees along present and abandoned channels of the Red River. These soils formed in thick beds of silty alluvium. The native vegetation was mixed hardwood. Slopes are 0 to 2 percent.

Sterlington soils are geographically associated with Latanier and Oklared soils. Latanier soils occur on slightly lower areas of the flood plain, have a mollic epipedon, and a clayey over loamy control section. Oklared soils occur on natural levees adjacent to the Red River channel, are calcareous, do not have an argillic horizon, and have a coarse-loamy control section.

Typical pedon of Sterlington very fine sandy loam, 0 to 2 percent slopes, in a moist bermudagrass pasture, in the SW1/4NW1/4NE1/4, sec. 29, T. 14 S., R. 25 W.

Ap—0 to 7 inches; brown (7.5YR 5/4) very fine sandy loam; moderate medium granular structure; very friable; common medium and fine roots; strongly acid; clear smooth boundary.

A2—7 to 15 inches; brown (7.5YR 5/4) very fine sandy loam; weak medium subangular blocky structure; friable; common medium and fine roots; medium acid; clear smooth boundary.

B21t—15 to 30 inches; yellowish red (5YR 4/6) silt loam; few fine prominent light yellowish brown mottles; moderate medium subangular blocky structure; friable; few thin clay films on faces of peds; few fine roots; few fine pores; medium acid; clear smooth boundary.

B22t&A'2—30 to 45 inches; yellowish red (5YR 5/6) silt loam; moderate medium subangular blocky structure; very friable; common streaks and ped coatings of fine sandy loam; light yellowish brown (10YR 6/4); A'2 material makes up about 10 percent of the volume; few fine roots; slightly acid; gradual smooth boundary.

B'3—45 to 59 inches; yellowish red (5YR 5/6) loam; few fine prominent light yellowish brown mottles; weak medium subangular blocky structure; very friable; few streaks and ped coatings of fine sandy loam; few fine roots; slightly acid; clear wavy boundary.

C—59 to 72 inches; yellowish brown (10YR 5/6) fine sand; massive; very friable; few fine roots; neutral.

The solum is 36 to 60 inches thick. If the soil is not limed, reaction of the A horizon is very strongly acid or medium acid. The B horizon is strongly acid to slightly acid. The C horizon is strongly acid to moderately alkaline. Some pedons are calcareous in the C horizon.

The A horizon is 6 to 18 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 3; or hue of 7.5YR, value of 4 or 5, and chroma of 2 or 4; or hue of 5YR, value of 4, and chroma of 3 or 4.

The B horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 or 6. The B horizon is silt loam, loam, or very fine sandy loam.

The C horizon has hue of 10YR, value of 4, and chroma of 4, or value of 5 and chroma of 4 or 6; or hue of 7.5YR, value of 4, and chroma of 4 or 6, or value of 5 and chroma of 6; or hue of 5YR, value of 4 or 5, and chroma of 4 or 6. Texture is fine sand, very fine sandy loam, loam, or silt loam.

Sumter series

The Sumter series consists of moderately deep, well drained, slowly permeable, gently sloping to moderately sloping soils that formed in residuum from calcareous chalk. These soils occur on eroded hilltops and hillsides in the Blackland Prairies. The native vegetation was prairie grasses and in places eastern redcedar and Bois d'arc. Slopes are 3 to 12 percent.

Sumter soils are geographically associated with Demopolis, Houston, Oktibbeha, and Terouge soils. Demopolis soils are on a similar landscape, have a loamy-skeletal control section, and are shallower to chalk. Houston soils occur on a higher landscape, have mollic epipedons, a clayey control section, and are deeper to chalk. Oktibbeha soils are on a higher intermingled landscape, have acid, red argillic horizons, have a very-fine control section, and are deeper to chalk. Terouge soils occur on flood plains, have a thicker and darker surface layer, have a clayey control section, and are deeper to chalk.

Typical pedon of Sumter clay, 3 to 12 percent slopes, eroded, in a moist idle area in the NE1/4SW1/4NE1/4 sec. 11, T. 11 S., R. 26 W.

Ap—0 to 4 inches; olive (5Y 5/3) clay; few fine faint dark gray mottles; moderate medium granular structure; friable; plastic and sticky; common fine roots; about 1 percent by volume fragments of chalk; moderately alkaline; calcareous; clear smooth boundary.

B21—4 to 18 inches; olive (5Y 5/6) clay; moderate medium subangular blocky structure; firm; sticky and plastic; few fine roots; 5 percent by volume olive gray fragments of chalk; moderately alkaline; calcareous; clear smooth boundary.

B22—18 to 27 inches; pale olive (5Y 6/4) clay; common coarse distinct light olive brown (2.5Y 5/6) mottles; moderate medium subangular blocky structure; firm; sticky and plastic; few fine roots; about 10 percent by volume olive gray fragments of chalk; moderately alkaline; calcareous; clear wavy boundary.

C—27 to 35 inches; light olive gray (5Y 6/2) soft chalk mottled with olive (5Y 5/6) and light olive brown (2.5Y 5/6).

Cr—35 to 50 inches; gray (5Y 5/1) hard, rippable chalk that can be cut with a spade; mottled with olive (5Y 5/6) and light olive brown (2.5Y 5/6); horizontal spacing between roots is greater than 4 inches.

The solum is 20 to 40 inches thick. Reaction is moderately alkaline and calcareous throughout.

The A horizon ranges from 4 to 7 inches in thickness. The A1 or Ap horizon has hue of 2.5Y, value of 4 or 5, and chroma of 2; or hue of 5Y, value of 3, and chroma of 1, or value of 5 and chroma of 2 or 3.

If present, the B1 horizon has hue of 2.5Y, value of 6 or 7, and chroma of 4. It generally has mixed materials with colors similar to those of the A horizon. The B2 horizon has hue of 2.5Y, value of 6 or 7, and chroma of 4; or hue of 5Y, value of 5, and chroma of 3 or 6, or value of 6 or 7 and chroma of 3 or 4. Few to common mottles are in shades of brown and yellow. The B horizon is silty clay loam, silty clay, or clay.

The C horizon has hue of 2.5Y, value of 6 or 7, and chroma of 2; or hue of 5Y, value of 6, and chroma of 1 or 2, or value of 7 and chroma of 2. Mottles are in shades of brown and yellow. The C horizon is mainly clay or chalk that can be cut with a spade.

Terouge series

The Terouge series consists of deep, somewhat poorly drained, very slowly permeable, level soils on flood plains. These soils formed in thick beds of calcareous alluvium from streams draining the Blackland Prairies. The native vegetation was mixed hardwoods and prairie grasses. Terouge soils have a seasonally high water table during winter and spring. Slopes are 0 to 1 percent.

Terouge soils are geographically associated with Marietta, Sumter, Tuscumbia, and Una soils. Marietta soils occur on the upper reaches of the flood plain, have a more acid surface layer, have a cambic horizon, and have a fine-loamy control section. Sumter soils occur on adjacent uplands, do not have a dark surface layer, and are shallower to chalk. Tuscumbia soils are on a similar landscape, have a thinner surface layer that is more acid, have a cambic horizon, and are more poorly drained. Una soils occur on lower areas of the flood plain, have a cambic horizon, are more poorly drained, and are more acid throughout.

Typical pedon of Terouge silty clay, occasionally flooded, in a moist soybean field, in the SW1/4SW1/4SW1/4, sec. 5, T. 11 S., R. 25 W.

Ap1—0 to 4 inches; very dark grayish brown (2.5Y 3/2) silty clay; massive becoming granular in the upper 2 to 3 centimeters upon drying; firm; very plastic; many fine and medium roots; many fine pores; many medium carbonate concretions; common fine fragments of shells; calcareous; mildly alkaline; abrupt wavy boundary.

Ap2—4 to 8 inches; very dark grayish brown (2.5Y 3/2) silty clay; massive; firm; very plastic; few fine roots; common fine pores; few medium carbonate concretions; few fine fragments of shells; few worm channels; calcareous; moderately alkaline; clear wavy boundary.

AC1g—8 to 15 inches; dark olive gray (5Y 3/2) silty clay; few fine distinct grayish brown mottles; moderate fine and medium blocky natural soil fragments; firm; very sticky; common fine roots; many fine and very fine pores; many vertical streaks 1/4 to 1 inch wide of material from the A horizon; few intersecting slickensides; common crayfish channels; few medium carbonate concretions; calcareous; moderately alkaline; clear irregular boundary.

AC2g—15 to 26 inches; very dark gray (10YR 3/1) silty clay; few fine distinct dark yellowish brown mottles; moderate fine and medium blocky natural soil fragments; firm; very plastic; common fine roots; many very fine and fine pores; few intersecting slickensides; many pressure faces; many vertical streaks 1/4 to 1 inch wide of material from the A horizon; few crayfish channels; calcareous; moderately alkaline; clear irregular boundary.

C1g—26 to 42 inches; dark gray (N 4/0) silty clay; common medium distinct dark yellowish brown (10YR 4/4) and few fine prominent yellowish red mottles; moderate medium blocky natural soil fragments; firm; very plastic; few fine roots; many very fine and fine pores; common intersecting slickensides up to 6 inches across; few streaks of material from the A horizon; few crayfish channels; few medium carbonate concretions; calcareous; moderately alkaline; clear broken boundary.

C2g—42 to 60 inches; dark gray (N 4/0) silty clay; common medium distinct grayish brown (2.5Y 5/2) and few fine distinct yellowish brown mottles; strong coarse blocky natural soil fragments; firm; very sticky; few fine roots; common very fine and fine pores; many intersecting slickensides ranging from 6 to 12 inches across; few streaks of material from the A horizon terminating in this horizon; few medium carbonate concretions; calcareous; moderately alkaline; clear wavy boundary.

C3g—60 to 72 inches; dark gray (N 4/0) silty clay; common medium distinct grayish brown (5Y 5/2) mottles; moderate coarse blocky natural soil fragments; firm; very plastic; common medium carbonate concretions; calcareous; moderately alkaline.

The soil is neutral to moderately alkaline and calcareous throughout.

The A horizon is 6 to 15 inches thick. The A horizon has hue of 10YR, 2.5Y, or 5Y, value of 2 or 3, and chroma of 2 or 3. Mottles are few to many in shades of olive and brown.

The AC and C horizons have hue of 10YR, 2.5Y, or 5Y, value of 3 or 4, and chroma of 0 to 2. Mottles are few to many in shades of olive, brown, or red. Texture is silty clay or clay.

Trebloc series

The Trebloc series consists of deep, poorly drained, level to nearly level soils that formed in thick, silty marine sediment. These soils are on upland flats and shallow swales in the Coastal Plains. The native vegetation was mixed hardwoods and pine. Slopes are 0 to 2 percent.

Trebloc soils are geographically associated with Mayhew, Sacul, and Sawyer soils. Mayhew soils are on a slightly higher landscape and have a fine control section. Sacul soils are on a higher, more dissected landscape, have a redder subsoil, are better drained, and have a clayey control section. Sawyer soils are on a higher landscape, are browner in the upper part of the subsoil, and are better drained.

Typical pedon of Trebloc silt loam, 0 to 2 percent slopes, in a moist pasture area, in the NW1/4SE1/4SE1/4 sec. 19, T. 12 S., R. 24 W.

Ap—0 to 7 inches; grayish brown (10YR 5/2) silt loam; common fine faint yellowish brown and dark brown mottles; moderate medium granular structure; friable; many medium and fine roots; few fine pores; few iron-managansese concretions; strongly acid; clear smooth boundary.

B21tg—7 to 32 inches; gray (10YR 6/1) silt loam; few fine distinct yellowish brown and dark brown mottles; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; common fine roots; few fine pores; few iron-manganese concretions; very strongly acid; gradual smooth boundary.

B22tg—32 to 42 inches; gray (10YR 5/1) silty clay loam; common fine faint yellowish brown and few fine distinct strong brown mottles; moderate medium subangular blocky structure; firm; common thin patchy clay films on faces of peds; few fine roots; few iron-manganese concretions; very strongly acid; clear wavy boundary.

B23tg—42 to 52 inches; gray (10YR 5/1) silty clay; few fine faint dark gray and common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; thick patchy clay films on faces of peds; few fine roots; few fine pores; few iron-manganese concretions; strongly acid; abrupt wavy boundary.

B24tg—52 to 63 inches; grayish brown (10YR 5/2) silty clay; few fine faint dark gray and common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very firm; thick patchy clay films on faces of peds; few fine roots;

few fine pores; few iron-manganese concretions; strongly acid; gradual wavy boundary.

B25tg—63 to 72 inches; gray (10YR 5/1) silty clay; common medium distinct yellowish brown (10YR 5/6) and few to common distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; very firm; thick patchy clay films on faces of peds; few fine roots; few fine pores; few iron-manganese concretions; very strongly acid.

The solum is 60 to more than 72 inches thick. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed.

The A horizon ranges from 5 to 10 inches in thickness. The A1 or Ap horizon has hue of 10YR, value of 4, and chroma of 1 or 2 or value of 5 and chroma of 2. If present, the A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 1.

The B horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Few to many mottles are in shades of brown and gray. The B horizon is silt loam, silty clay loam, or silty clay.

Tuscumbia series

The Tuscumbia series consists of deep, poorly drained, very slowly permeable, level soils on flood plains. These soils formed in thick beds of clayey alluvium from streams that drain the Blackland Prairies. They have a seasonal high water table during the winter and spring. The native vegetation was mixed hardwoods and prairie grasses. Slopes are 0 to 1 percent.

Tuscumbia soils are geographically associated with Marietta, Terouge, and Una soils. Marietta soils occur on the upstream reaches, have a browner surface layer, are better drained, and have a fine-loamy control section. Terouge soils occur on a similar landscape, have a thicker, darker surface layer, are more alkaline, and do not have cambic horizons. Una soils occur farther downstream, are more acid, and do not have vertic properties.

Typical pedon of Tuscumbia clay, occasionally flooded, in a moist soybean field, in the SW1/4NW1/4NE1/4, sec. 23, T. 10 S., R. 25 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) clay; common coarse faint gray (10YR 5/1) and few fine prominent yellowish red mottles; moderate medium granular structure; firm; sticky; many fine roots; few crayfish holes; few fine pores; few fine dark brown concretions; slightly acid; clear smooth boundary.

B21g—8 to 23 inches; dark gray (5Y 4/1) clay; common medium prominent dark yellowish brown (10YR 4/4) and common fine prominent strong brown mottles; moderate medium subangular blocky structure; firm; sticky; shiny pressure faces; few fine roots; few crayfish holes; few fine pores; few fine dark brown concretions; slightly acid; gradual wavy boundary.

B22g—23 to 33 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/8) and few fine distinct dark yellowish brown mottles; moderate medium subangular blocky structure; very firm; sticky and plastic; shiny pressure faces; few fine roots; few crayfish holes; few fine pores; few fine dark brown concretions; medium acid; gradual smooth boundary.

B23g—33 to 44 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/6) and few fine distinct strong brown mottles; moderate medium subangular blocky structure; very firm; sticky and plastic; shiny pressure faces; few slickensides; few fine roots; few crayfish holes; few fine pores; few fine dark brown concretions; medium acid; gradual smooth boundary.

B24g—44 to 59 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/6) and few fine distinct strong brown mottles; moderate medium and coarse subangular blocky structure; very firm; sticky and plastic; shiny pressure faces; many slickensides; few crayfish holes; few fine pores; few fine dark brown concretions; neutral; gradual smooth boundary.

B25g—59 to 72 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/6) and few fine distinct strong brown mottles; weak coarse subangular blocky structure; very firm; sticky and plastic; many slickensides; few crayfish holes; few fine dark brown concretions; neutral; weakly calcareous.

The solum is 50 to more than 72 inches thick. Reaction ranges from strongly acid through moderately alkaline throughout.

The A horizon ranges from 4 to 10 inches in thickness. The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2, or value of 5 and chroma of 2 or 3; or hue of 2.5Y, value of 3 through 5, and chroma of 2.

The B horizon has hue of 10YR, value of 4 through 7, and chroma of 1, or value of 6 or 7 and chroma of 2; or hue of 2.5Y, value of 6 or 7, and chroma of 2; or hue of 5Y, value of 4 through 7, and chroma of 1; or neutral hue, value of 4 through 6, and chroma of 0. Mottles in shades of brown and yellow range from few to many. Texture is clay, silty clay, or silty clay loam.

If present, the C horizon has color and texture similar to the C horizon.

Una series

The Una series consists of deep, poorly drained, level soils on flood plains. These soils formed in thick beds of clayey alluvium from streams that drain the Blackland Prairies. They have a seasonal high water table during the winter and spring. The native vegetation was mixed hardwoods and prairie grasses. Slopes are 0 to 1 percent.

Una soils are geographically associated with the Marietta, Terouge, and Tuscumbia soils. Marietta soils occur farther upstream, are better drained, and have a fine-loamy control section. Terouge soils occur on a similar landscape, have a thicker, darker surface layer, and are more alkaline. Tuscumbia soils occur farther upstream, are less acid, and have vertic properties.

Typical pedon of Una silty clay loam, occasionally flooded, in a moist soybean field, in the SW1/4-SW1/4NE1/4, sec. 33, T. 11 S., R. 23 W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silty clay loam; few fine distinct grayish brown mottles; moderate medium granular structure; firm; many fine roots; few crayfish holes; many fine pores; few fine dark brown concretions; medium acid; clear smooth boundary.

B21g—7 to 17 inches; dark gray (10YR 4/1) silty clay; common fine faint gray mottles; moderate medium subangular blocky structure; firm; many fine roots; few crayfish holes; many fine pores; few fine dark brown concretions; strongly acid; clear wavy boundary.

B22g—17 to 32 inches; gray (10YR 6/1) clay loam; common medium distinct yellowish brown (10YR 5/6) and few fine distinct brown mottles; moderate medium subangular blocky structure; firm; shiny pressure faces; few fine pores; many fine dark brown concretions; strongly acid; clear wavy boundary.

B23g—32 to 57 inches; gray (10YR 6/1) clay; common medium distinct yellowish brown (10YR 5/6) and few fine prominent yellowish red mottles; moderate medium subangular blocky structure; firm; shiny pressure faces; few fine roots; few crayfish holes; few fine pores; many fine dark brown concretions; strongly acid; clear wavy boundary.

B24g—57 to 72 inches; gray (10YR 6/1) clay; common medium distinct yellowish brown (10YR 5/6) and few fine distinct strong brown mottles; weak coarse subangular blocky structure; very firm; sticky and plastic; shiny pressure faces; few fine roots; few crayfish holes; few fine pores; few fine brown concretions; very strongly acid.

The solum exceeds 60 inches in thickness. Reaction of the soil is strongly acid or very strongly acid throughout except where the surface layer has been limed.

The A horizon is 5 to 10 inches thick. The A horizon has hue of 10YR, value of 4 through 6, and chroma of 1, or value of 5 and chroma of 2; or hue of 5Y, value of 4 through 6, and chroma of 1; or hue of 2.5Y, value of 5, and chroma of 2.

The B horizon has hue of 10YR, value of 4 through 6, and chroma of 1 or value of 6 and chroma of 2; or hue of 5Y, value of 5 or 6, and chroma of 1 or 2; or hue of 2.5Y, value of 6, and chroma of 2. Few to common mottles are in shades of brown and yellow. Texture is silty clay loam, clay loam, silty clay, or clay.

Classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*4*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 21, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Haplaquents (*Hapl*, meaning simple horizons, plus *aquent*, the suborder of Entisols that have an aquic moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is fine, mixed, acid, thermic, Typic Haplaquents.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

Formation of the soils

This section discusses the factors of soil formation, relates them to soils in the survey area, and explains the processes of soil formation.

Factors of soil formation

Soil is formed by the interaction of climate, living organisms, parent material, and relief over a period of time. Each of these factors modifies the effect of the other four. Significant differences in any one of the factors result in differences in soil characteristics (*6*).

Climate and living organisms are the active forces in soil formation. Relief, mainly by its influence on runoff and temperature, modifies the effect of climate and living organisms. The parent material also affects the kind of soil that can be formed, and, in extreme cases, determines it almost entirely. Finally, time is needed for the changing of the parent material into soil.

Climate

The climate in Hempstead County is characterized by long, hot, humid summers; short, mild winters; and abundant rainfall. It probably has changed little while the soils have been forming. Even though the temperature, on the average, may be somewhat lower in the northern part of the county than in the southern part, the climate is uniform throughout the county. Consequently, it does not account for significant differences among the soils.

The warm moist climate promotes rapid chemical reaction and rapid soil formation. Abundant rainfall makes a large amount of water available for the leaching of soluble and colloidal materials. The organic acids from decomposed plant remains hasten the development of clay minerals and the removal of carbonates. Because the soil freezes only for short periods, soil formation continues almost the year round.

Living organisms

Such living organisms as bacteria, fungi, insects, and the more highly developed flora and fauna are important to soil formation. These organisms help to increase the content of organic matter, to increase the supply of nitrogen, to decrease or increase the supply of other plant nutrients, and to change the structure and porosity of the soils.

Before the settlement of the county, native vegetation had more influence on soil development than did animal activity. The native vegetation of the county was mixed pine and hardwood trees, except in the blackland areas where prairies were dominant.

On the poorly drained to well drained, loamy and clayey flood plains and low terraces, the trees were predominantly sweetgum, oak, ash, baldcypress, sycamore, hackberry, and pecan. In these areas the Desha, Gore, Guyton, Latanier, McKamie, Oklared, Ouachita, Perry, Portland, Sardis, and Sterlington soils formed. In the poorly drained upland flatwoods, the trees were mainly oak, sweetgum, and pine. In these areas some of the Trebloc and Smithton soils formed.

On the moderately well drained to somewhat excessively drained, loamy and clayey uplands of the Coastal Plains, the trees were mainly pine, oak, and hickory. In these areas the Alaga, Bowie, Briley, Harleston, Kirvin, Mayhew, Millwood, Ora, Ruston, Sacul, Saffell, Savannah, Sawyer, and Smithdale soils formed.

On the moderately well drained to well drained Blackland Prairie uplands, the native vegetation was mainly tall native grasses and some redcedar, elm, and osageorange. In these areas the Demopolis, Houston, Kipling, Oktibbeha, and Sumter soils formed. Mixed pine and hardwoods grew in many areas of the Oktibbeha soils. On the flood plains in the blackland area, the vegetation was baldcypress and such hardwoods as oak, sweetgum, hackberry, and ash. In these areas the Marietta, Terouge, Tuscumbia, and Una soils formed.

Since the development of farming in the county, man has influenced the formation of the soils. He cleared the forests, broke the sod, tilled the soil, introduced new plants, fertilized, and improved drainage. Only a few results of these activities are evident now. These include changes in the structure and color of the soil, in the content of organic matter and of nutrients, and in the thickness of the surface layer or plow layer. Many other results may not be evident for several centuries. In many of the areas that have remained in forest, man has influenced soil formation through such woodland management practices as selective harvesting, improving the timber stand by removing hardwoods, and planting pure stands of preferred species.

Parent material

The soils in the county formed mainly in sediments of Pleistocene and Holocene age. The sediments of Pleistocene age are deposits of unconsolidated loamy and gravelly material on terraces and are on much of the interstream surface. Among the soils that formed in the loamy areas, many of which have interstratified clayey sediment, are Bowie, Ruston, Sacul, and Savannah soils. Saffell soils formed in the gravelly material. Recent alluvial deposits of loamy sediment are on the stream flood plains and low terraces, and in these places the Guyton, Ouachita, and Sardis soils formed.

Scattered throughout the county are soils that formed in residuum of chalk and marl of Cretaceous age. The Demopolis, Houston, Kipling, Oktibbeha, and Sumter soils formed on uplands. The Marietta, Terouge, Tuscumbia, and Una soils formed on flood plains.

Parallel to the Red River in the western part of the county, the soils formed in alluvial sediment that came mainly from the Permian Red Beds. In this sediment the Desha, Gore, Latanier, McKamie, Oklared, Perry, Portland, and Sterlington soils formed.

Relief

Relief affects soil formation through its influence on drainage, erosion, plant cover, and soil temperature. In some places of Hempstead County, it ranges from level to nearly vertical, for example, bluffs. The slope is dominantly 1 to 20 percent.

The Coastal Plains and Blackland Prairies are characterized by level to rolling topography. Slopes are as much as 20 percent, but most are less than 12 percent.

Level areas where runoff is slow or ponded are scattered throughout the county. In these areas, the soils are gray because of the reduction and transfer of iron.

Flood plains along the streams are long and narrow to wide, mainly level areas where the soils are loamy and clayey. In these areas the slopes are mainly less than 1 percent and rarely more than 2 percent. Most of these areas are subject to occasional or more frequent floods that deposit more sediment.

Time

The length of time required for formation of soil depends mainly on the other factors of soil formation. Less time usually is required if the climate is warm and humid, the vegetation is luxuriant, and the parent material is loamy. Older soils generally show a greater degree of differentiation between horizons.

The soils of the uplands generally have the most strongly developed argillic horizons and are the most mature soils in Hempstead County. On the uplands some soils, such as Alaga soils, have so little clay that they are not likely to develop a mature profile in the near geologic future. Soils on the flood plains consists of younger material and are much less mature than most soils on the uplands. Among these are Marietta and Oklared soils.

Processes of soil formation

Most soil profiles contain three major horizons—A, B, and C. Some have an R horizon of bedrock. The A horizon is the surface layer. It can be the A1 horizon, which is the horizon of maximum accumulation of organic matter, or the A2 horizon, which is the horizon of maximum leaching of dissolved or suspended materials.

The B horizon is immediately below the A horizon. It contains the maximum accumulation of dissolved or suspended materials, such as iron or clay. The B horizon generally is firmer than horizons immediately above and below it and commonly has blocky structure (*8*).

The C horizon is below the B horizon. It generally has been little affected by the soil forming processes, except for weathering. Some young soils have no B horizon, and their C horizon is immediately below the A horizon. In these soils the C horizon has been slightly modified by living organisms as well as by weathering.

The soils of Hempstead County have horizons that formed through one or more of the following processes: (1) the accumulation of organic matter, (2) the leaching of bases, (3) the reduction and transfer of iron, and (4) the translocation of silicate clay minerals. In most of the soils, more than one of these processes was involved.

Accumulation of organic matter in the uppermost part of the profile has been an important process in horizon development. The A1 horizon is darker in color than the A2 horizon because it has more organic matter. In the A2 horizon, organic matter as well as clay minerals and iron oxide have been removed. The content of organic matter ranges from very low to moderate in most of the soils of Hempstead County.

Most of the soils of the county have been leached of carbonates. Generally, the leaching of bases precedes the translocation of silicate clay minerals.

Reduction and transfer of iron are evident in all of the somewhat poorly drained and poorly drained soils. This process is called gleying. Gray colors in the layers below the surface layer are evidence of the reduction and loss of iron. Mottles of red, brown, and yellow in some horizons and iron concretions in others are made up of segregated iron compounds in complex with organic matter and oxides of manganese or other metals. Gleying has been important in the formation of Guyton and Smithton soils.

Translocation, or downward movement, of clay minerals has contributed to horizon development in most of the soils. The eluviated A2 horizon has less clay and generally is lighter in color than the B horizon. Clay has accumulated in the B horizons in the form of clay films in pores and on the surface of peds. In most soils the C horizon has less clay than the B horizon.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim. An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single mapping unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	More than 9

Base saturation. The degree to which material having base exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the exchange capacity.

Bottom land. The normal flood plain of a stream, subject to frequent flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or magnesium carbonate.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. Mineral or rock particles up to 3 inches (2 millimeters to 7.5 centimeters) in diameter.

Coarse textured (light textured) soil. Sand or loamy sand.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures is difficult.

Complex, soil. A mapping unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Compressible. Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is 40 or 80 inches (1 or 2 meters).

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Deferred grazing. A delay in grazing until range plants have reached a specified stage of growth. Grazing is deferred in order to increase the vigor of forage and to allow desirable plants to produce seed. Contrasts with continuous grazing and rotation grazing.

Depth to rock. Bedrock at a depth that adversely affects the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake. The rapid movement of water into the soil.

Favorable. Favorable soil features for the specified use.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured (heavy textured) soil. Sandy clay, silty clay, and clay.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May,* for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Forage. Plant material used as feed by domestic animals. Forage can be grazed or cut for hay.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. A soil having one or more neutral gray horizons as a result of waterlogging and lack of oxygen. The term "gleyed" also designates gray horizons and horizons having yellow and gray mottles as a result of intermittent waterlogging.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material from 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table, which is the upper limit of saturation.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Habitat. The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered, but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Leaching. The removal of soluble material from soil or other material by percolating water.

Light textured soil. Sand and loamy sand.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. Inadequate strength for supporting loads.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Moderately coarse textured (moderately light textured) soil. Sandy loam and fine sandy loam.

Moderately fine textured (moderately heavy textured) soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three single variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Pan. A compact, dense layer in a soil. A pan impedes the movement of water and the growth of roots. The word "pan" is commonly combined with other words that more explicitly indicate the nature of the layer; for example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Permafrost. Layers of soil, or even bedrock, occuring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

Phase, soil. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the bases of differences in slope, stoniness, thickness, or some other characterisitc that affects management. These differencees are too small to justify separate series.

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water forms subsurface tunnels or pipelike cavities in the soil.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents that commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on exposure to repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade, whereas ironstone cannot be cut but can be broken or shattered with a spade. Plinthite is one form of the material that has been called laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Polypedon. A volume of soil having properties within the limits of a soil series, the lowest and most homogeneous category of soil taxonomy. A "soil individual."

Poorly graded. Refers to soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Range (or rangeland). Land that, for the most part, produces native plants suitable for grazing by livestock; includes land supporting some forest trees.

Range condition. The health or productivity of forage plants on a given range, in terms of the potential productivity under normal climate and the best practical management. Condition classes generally recognized are—*excellent, good, fair,* and *poor.* The classification is based on the percentage of original, or assumed climax vegetation on a site, as compared to what has been observed to grow on it when well managed.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulates over disintegrating rock.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth. Shallow root zone. The soil is shallow over a layer that greatly restricts roots. See Root zone.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake. The slow movement of water into the soil.

Small stones. Rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Small stones adversely affect the specified use.

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.005 to 0.002 millimeter); and *clay* (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil, or partly worked into the soil, to provide protection from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitaion is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use or management.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or " very fine."

Thin layer. Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Trace elements. The chemical elements in soils, in only extremely small amounts, essential to plant growth. Examples are zinc, cobalt, manganese, copper, and iron.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Unstable fill. Risk of caving or sloughing in banks of fill material.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to a soil or soil material consisting of particles well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content or soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Illustrations

Figure 1.—Alaga fine sand, 3 to 8 percent slopes, is well suited to watermelons.

Figure 2.—Bowie fine sandy loam, 1 to 3 percent slopes, has good potential for hay and pasture and is used mainly for hay and pasture.

Figure 3.—Houston soils have a high shrink-swell potential. When the soil is dry, it expands, and cracks form; the cracks seal when the soil is wet.

Figure 4.—Latanier silty clay, occasionally flooded, has good potential for soybeans.

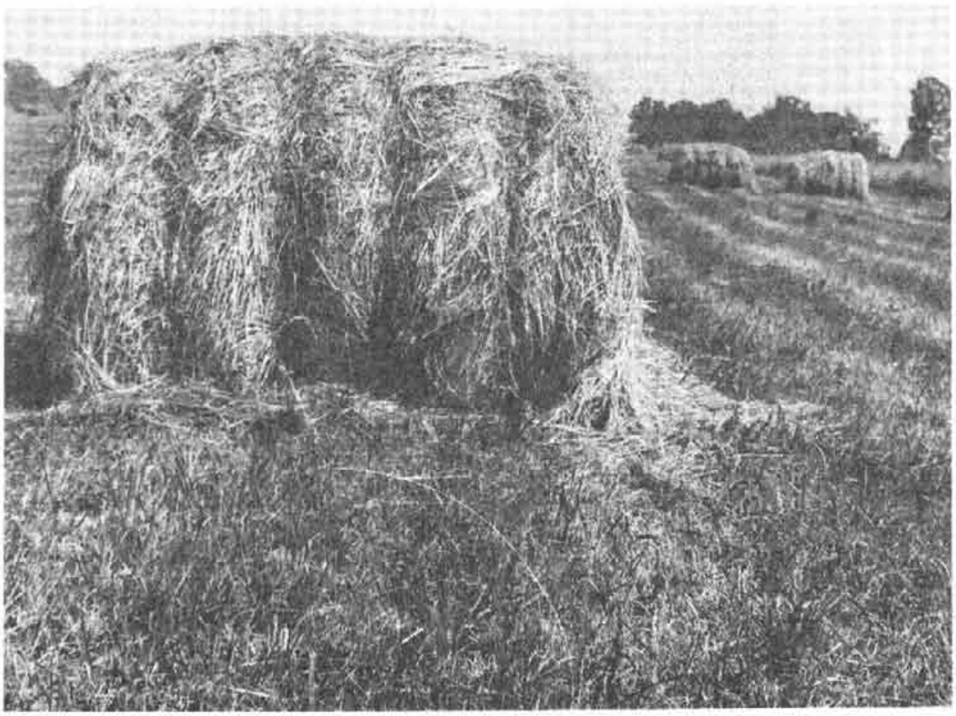

Figure 5.—Millwood silt loam, 3 to 8 percent slopes, has fair potential for such pasture plants as bermudagrass.

Figure 6.—Ora fine sandy loam, 3 to 8 percent slopes, has good potential for vegetable crops.

Figure 7.—A 20-year-old loblolly pine plantation on Sacul fine sandy loam, 3 to 8 percent slopes.

Figure 8.—A meadow of bermudagrass and bahiagrass on Sawyer loam, 1 to 3 percent slopes.

Figure 9.—Tuscumbia clay, occasionally flooded, has good potential for cotton.

Tables

TABLE 1.--ACREAGE OF PRINCIPAL CROPS

Crops	Acres in 1964	Acres in 1969
Vegetables	566	199
Field corn	2,068	328
Cotton	2,847	808
Soybeans (for beans)	7,358	15,521
Hay crops	20,207	16,583

TABLE 2.--NUMBER AND KIND OF LIVESTOCK AND POULTRY IN SELECTED YEARS

Livestock and poultry	1964	1969
Cattle and calves	41,082	37,128
Milk cows	1,465	1,208
Hogs and pigs	1,536	722
Chickens, 3 months old or older	695,615	2,801,185

TABLE 3.--TEMPERATURE AND PRECIPITATION DATA

Month	Temperature[1]						Precipitation[1]				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[2]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	F	F	F	F	F	Units	In	In	In		In
January----	53.2	30.7	41.9	78	10	20	3.65	1.86	5.10	6	1.1
February---	57.6	33.4	45.6	78	15	58	3.86	1.90	5.45	6	.7
March------	64.7	40.3	52.5	84	21	184	4.40	2.37	6.05	7	.1
April------	74.5	50.1	62.3	88	30	369	5.76	2.61	8.32	7	.0
May--------	82.2	58.5	70.4	93	41	632	5.16	2.63	7.22	7	.0
June-------	88.7	66.3	77.5	98	52	825	4.28	1.04	6.84	6	.0
July-------	92.7	69.7	81.2	101	58	967	4.05	1.58	6.04	5	.0
August-----	92.5	68.1	80.3	102	56	939	4.11	1.35	6.30	6	.0
September--	86.7	61.8	74.3	99	44	729	4.17	1.77	6.15	5	.0
October----	77.6	49.9	63.8	93	31	428	3.56	1.21	5.46	5	.0
November---	64.9	39.3	52.1	83	20	127	4.31	2.14	6.07	5	.0
December---	55.9	32.6	44.3	78	13	36	4.26	2.22	5.92	6	.5
Year------	74.3	50.1	62.2	103	8	5,314	51.57	41.89	60.76	71	2.4

[1]Recorded in the period 1951-74 at Hope, Ark.

[2]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 F).

TABLE 4.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature[1]		
	24 F or lower	28 F or lower	32 F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 20	March 30	April 14
2 years in 10 later than--	March 12	March 23	April 9
5 years in 10 later than--	February 24	March 11	March 30
First freezing temperature in fall:			
1 year in 10 earlier than--	November 7	October 28	October 23
2 years in 10 earlier than--	November 14	November 2	October 27
5 years in 10 earlier than--	November 28	November 12	November 3

[1]Recorded in the period 1951-74 at Hope, Ark.

TABLE 5.--GROWING SEASON LENGTH

Probability	Daily minimum temperature during growing season[1]		
	Higher than 24 F	Higher than 28 F	Higher than 32 F
	Days	Days	Days
9 years in 10	244	219	198
8 years in 10	254	228	204
5 years in 10	276	246	217
2 years in 10	297	264	230
1 year in 10	307	273	236

[1]Recorded in the period 1051-74 at Hope, Ark.

TABLE 6.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Alaga fine sand, 3 to 8 percent slopes	1,317	0.3
2	Bowie fine sandy loam, 1 to 3 percent slopes	4,378	1.0
3	Bowie fine sandy loam, 3 to 8 percent slopes	10,787	2.3
4	Briley loamy fine sand, 3 to 8 percent slopes	9,838	2.1
5	Briley-Alaga association, rolling	7,314	1.6
6	Demopolis silty clay loam, gullied	2,128	0.5
7	Desha clay, occasionally flooded	5,746	1.3
8	Gore silt loam, 0 to 2 percent slopes	4,584	1.0
9	Guyton silt loam, occasionally flooded	24,987	5.4
10	Harleston loamy fine sand, 1 to 3 percent slopes	6,597	1.4
11	Harleston loamy fine sand, 3 to 8 percent slopes	1,958	0.4
12	Houston clay, 1 to 3 percent slopes	2,482	0.5
13	Houston clay, 3 to 8 percent slopes, eroded	6,137	1.3
14	Kipling loam, 1 to 3 percent slopes	9,511	2.0
15	Kipling silty clay loam, 3 to 8 percent slopes, eroded	8,922	1.9
16	Kirvin fine sandy loam, 3 to 8 percent slopes	13,702	3.0
17	Kirvin fine sandy loam, 8 to 12 percent slopes	1,822	0.4
18	Latanier silty clay, occasionally flooded	3,967	0.9
19	Latanier silty clay, frequently flooded	674	0.1
20	Marietta loam, occasionally flooded	5,291	1.1
21	Mayhew silty clay loam, 0 to 2 percent slopes	6,462	1.4
22	McKamie silty clay loam, 3 to 8 percent slopes, eroded	7,131	1.5
23	McKamie fine sandy loam, 8 to 12 percent slopes	2,097	0.5
24	Millwood silt loam, 3 to 8 percent slopes	12,297	2.6
25	Oklared very fine sandy loam	1,668	0.4
26	Oklared very fine sandy loam, occasionally flooded	3,796	0.8
27	Oktibbeha silty clay loam, 3 to 8 percent slopes, eroded	11,648	2.5
28	Oktibbeha clay, 8 to 12 percent slopes, eroded	12,036	2.6
29	Oktibbeha-Saffell association, rolling	3,449	0.7
30	Ora fine sandy loam, 3 to 8 percent slopes	12,732	2.7
31	Ouachita silt loam, occasionally flooded	1,051	0.2
32	Perry clay, occasionally flooded	3,257	0.7
33	Portland clay, occasionally flooded	7,221	1.6
34	Ruston fine sandy loam, 1 to 3 percent slopes	2,213	0.5
35	Sacul fine sandy loam, 3 to 8 percent slopes	35,147	7.7
36	Sacul fine sandy loam, 8 to 12 percent slopes	15,435	3.3
37	Sacul-Kirvin association, rolling	33,760	7.3
38	Saffell gravelly fine sandy loam, 3 to 8 percent slopes	4,675	1.0
39	Saffell gravelly fine sandy loam, 8 to 12 percent slopes	3,847	0.8
40	Sardis silt loam, occasionally flooded	6,659	1.4
41	Savannah fine sandy loam, 1 to 3 percent slopes	7,958	1.7
42	Savannah fine sandy loam, 3 to 8 percent slopes	19,808	4.3
43	Sawyer loam, 1 to 3 percent slopes	9,818	2.1
44	Sawyer loam, 3 to 8 percent slopes	16,445	3.5
45	Smithdale fine sandy loam, 3 to 8 percent slopes	18,427	4.0
46	Smithton fine sandy loam	19,002	4.1
47	Sterlington very fine sandy loam, 0 to 2 percent slopes	1,594	0.3
48	Sumter clay, 3 to 12 percent slopes	9,005	1.9
49	Terouge silty clay, occasionally flooded	8,271	1.8
50	Trebloc silt loam, 0 to 2 percent slopes	907	0.2
51	Tuscumbia clay, occasionally flooded	12,770	2.7
52	Una silty clay loam, occasionally flooded	17,232	3.7
	Water	4,680	1.0
	Total	464,640	100.0

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. The estimates were made in 1976. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Cotton lint	Soybeans	Corn	Wheat	Common bermuda-grass	Improved bermuda-grass	Tall fescue
	Lb	Bu	Bu	Bu	AUM[1]	AUM[1]	AUM[1]
Alaga:							
1	---	---	50	---	---	7.5	---
Bowie:							
2	450	---	50	---	---	12	---
3	425	---	45	---	---	10	---
Briley:							
4	275	---	40	---	---	6.5	---
[2]5:							
Briley part	---	---	---	---	---	5.5	---
Alaga part	---	---	---	---	---	6.5	---
Demopolis:							
6	---	---	---	---	4.5	---	---
Desha:							
7	500	35	---	40	6	9	8
Gore:							
8	---	23	---	---	4.5	---	---
Guyton:							
9	---	---	---	---	6.0	---	---
Harleston:							
10	---	30	80	---	---	10.5	---
11	---	25	75	---	---	9.0	---
Houston:							
12	650	40	70	40	---	---	---
13	---	---	---	---	---	---	---
Kipling:							
14	500	30	---	40	---	8.5	6.5
15	---	---	---	---	---	8.0	6.0
Kirvin:							
16	---	---	---	---	7	8	---
17	---	---	---	---	6	7	---
Latanier:							
18	---	35	---	50	6.0	---	---
19	---	---	---	---	5.5	---	---
Marietta:							
20	700	40	90	30	7.0	12.0	12.0
Mayhew:							
21	---	30	---	---	7.0	---	8.0
McKamie:							
22	---	21	---	---	5.0	---	---
23	---	---	---	---	4.5	---	---

See footnotes at end of table.

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Cotton lint	Soybeans	Corn	Wheat	Common bermuda-grass	Improved bermuda-grass	Tall fescue
	Lb	Bu	Bu	Bu	AUM[1]	AUM[1]	AUM[1]
Millwood:							
24	---	---	---	---	5.0	6.5	---
Oklared:							
[3]25	650	---	65	50	---	8.0	7.0
26	650	---	60	---	---	8.0	7.0
Oktibbeha:							
27	---	30	50	---	60	7.0	6.0
28	---	---	---	---	---	---	---
[2]29:							
Oktibbeha part	---	---	---	---	6.0	7.0	6.0
Saffell part	---	---	---	---	3.0	4.0	---
Ora:							
30	550	30	70	40	---	8.0	7.5
Ouachita:							
31	---	35	70	45	9.0	12	8.0
Perry:							
32.							
Portland:							
[3]33	550	35	---	45	7.0	9.0	9.0
Ruston:							
34	600	30	70	40	6.0	12.0	---
Sacul:							
35	---	---	---	---	6.0	---	---
36	---	---	---	---	5.5	---	---
[2]37:							
Sacul part	---	---	---	---	5.5	---	---
Kirvin part	---	---	---	---	6.0	7.0	---
Saffell:							
38	---	---	---	30	4.0	5.0	---
39	---	---	---	---	3.5	4.5	---
Sardis:							
40	550	35	---	45	7.0	9.0	8
Savannah:							
41	600	35	75	35	6.0	8.5	8.0
42	550	30	70	---	---	8.0	7.5
Sawyer:							
43	500	25	50	---	7.0	9.0	7.0
44	500	20	45	---	7.0	9.0	7.0
Smithdale:							
45	550	30	65	45	5.5	9.0	---
Smithton:							
46	450	25	---	---	7.0	8.0	7.0

See footnotes at end of table.

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Cotton lint	Soybeans	Corn	Wheat	Common bermuda-grass	Improved bermuda-grass	Tall fescue
	Lb	Bu	Bu	Bu	AUM[1]	AUM[1]	AUM[1]
Sterlington: 47	850	35	90	---	7.0	15.5	---
Sumter: 48	---	---	---	---	---	---	---
Terouge: 49	600	35	---	---	7.0	9.0	9.0
Trebloc: 50	---	25	---	---	---	8.0	8.0
Tuscumbia: 51	650	30	70	---	7.0	---	9.5
Una: 52	---	25	---	---	7.5	---	9.0

[1]Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

[2]This map unit is made up of two or more dominant soils. See description of the map unit for the composition and behavior characteristics of the map unit.

[3]Yields are for areas protected from flooding.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that the information was not available. Site index was calculated at age 30 for eastern cottonwood, at age 35 for American sycamore, and at age 50 for all other species]

Soil name and map symbol	Wood-land suita-bility group	Management concerns: Erosion hazard	Management concerns: Equip-ment limita-tion	Management concerns: Seedling mortal-ity	Potential productivity: Important trees	Potential productivity: Site index	Trees to plant
1----------------- Alaga	3s3	Slight	Moderate	Severe	Loblolly pine---------- Shortleaf pine---------	80 70	Loblolly pine, shortleaf pine.
2, 3--------------- Bowie	3o1	Slight	Slight	Slight	Loblolly pine---------- Shortleaf pine---------	80 80	Loblolly pine, shortleaf pine.
4----------------- Briley	3s3	Slight	Slight	Severe	Loblolly pine---------- Shortleaf pine---------	80 70	Loblolly pine, shortleaf pine.
5*:							
Briley------------	3s3	Slight	Slight	Severe	Loblolly pine---------- Shortleaf pine---------	80 70	Loblolly pine, shortleaf pine.
Alaga-------------	3s3	Slight	Moderate	Severe	Loblolly pine---------- Shortleaf pine---------	80 70	Loblolly pine, shortleaf pine.
6----------------- Demopolis	4d3	Moderate	Moderate	Severe	Eastern redcedar-------	40	Eastern redcedar.
7----------------- Desha	3w6	Slight	Severe	Severe	Green ash-------------- Eastern cottonwood------ Water oak-------------- Water hickory----------	75 90 80 ---	Eastern cottonwood, sweetgum.
8----------------- Gore	3c2	Slight	Moderate	Moderate	Loblolly pine----------	78	Loblolly pine.
9----------------- Guyton	2w9	Slight	Severe	Moderate	Loblolly pine---------- Sweetgum--------------- Green ash-------------- Southern red oak-------- Water oak--------------	90 --- --- --- ---	Loblolly pine, sweetgum.
10, 11------------- Harleston	2w8	Slight	Moderate	Slight	Loblolly pine---------- Shortleaf pine--------- Sweetgum---------------	90 80 75	Loblolly pine.
12, 13------------- Houston	4c2	Slight	Moderate	Moderate	Eastern redcedar-------	40	Eastern redcedar.
14, 15------------- Kipling	2c8	Slight	Moderate	Moderate	Cherrybark oak--------- Loblolly pine---------- Shumard oak------------ Sweetgum--------------- Water oak-------------- White oak--------------	90 90 85 90 80 80	Cherrybark oak, loblolly pine, Shumard oak, sweetgum.
16, 17------------- Kirvin	3o1	Slight	Slight	Slight	Loblolly pine---------- Shortleaf pine---------	80 70	Loblolly pine, shortleaf pine.
18, 19------------- Latanier	2w5	Slight	Moderate	Moderate	Green ash-------------- Cherrybark oak--------- Water oak-------------- Pecan------------------ Sweetgum--------------- Eastern cottonwood------ American sycamore------	80 90 90 --- 90 110 ---	Eastern cottonwood, American sycamore.
20----------------- Marietta	1w5	Slight	Moderate	Moderate	Eastern cottonwood------ Green ash-------------- Sweetgum--------------- American sycamore------ Yellow-poplar----------	105 90 100 105 100	Eastern cottonwood, sweetgum, yellow-poplar, green ash, American sycamore.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Important trees	Potential productivity: Site index	Trees to plant
38, 39-------------- Saffell	4f2	Slight	Slight	Moderate	Loblolly pine---------- Shortleaf pine---------- Eastern redcedar--------	70 60 ---	Loblolly pine, shortleaf pine, eastern redcedar.
40----------------- Sardis	1w8	Slight	Moderate	Moderate	Loblolly pine---------- Sweetgum--------------- Water oak--------------	95 100 90	Loblolly pine, sweetgum.
41, 42------------- Savannah	3o7	Slight	Slight	Slight	Loblolly pine---------- Longleaf pine---------- Slash pine------------- Sweetgum--------------- Shortleaf pine----------	88 78 88 85 	Loblolly pine, sweetgum.
43, 44------------- Sawyer	2w8	Slight	Moderate	Slight	Loblolly pine---------- Shortleaf pine----------	90 90	Loblolly pine, shortleaf pine.
45----------------- Smithdale	3o1	Slight	Slight	Slight	Loblolly pine---------- Shortleaf pine----------	86 75	Loblolly pine, shortleaf pine.
46----------------- Smithton	2w9	Slight	Severe	Severe	Loblolly pine---------- Shortleaf pine---------- Sweetgum--------------- Cherrybark oak---------- Water oak--------------	90 80 90 90 90	Loblolly pine, sweetgum, cherrybark oak, Shumard oak.
47----------------- Sterlington	2o4	Slight	Slight	Slight	Green ash-------------- Eastern cottonwood----- Cherrybark oak---------- Water oak-------------- Pecan------------------ Sweetgum---------------	75 --- 95 90 --- 90	Eastern cottonwood.
48----------------- Sumter	4c2	Moderate	Moderate	Moderate	Eastern redcedar-------	40	Eastern redcedar.
49----------------- Terouge	4c2	Moderate	Moderate	Moderate	Eastern redcedar------- Osageorange------------	40 ---	Eastern redcedar.
50----------------- Trebloc	2w9	Slight	Severe	Severe	Loblolly pine---------- Sweetgum--------------- Water oak-------------- Willow oak-------------	95 90 85 80	Green ash, loblolly pine, Nuttall oak, Shumard oak, sweetgum.
51----------------- Tuscumbia	2w6	Slight	Moderate	Severe	Eastern cottonwood----- Green ash-------------- Sweetgum---------------	100 95 85	Eastern cottonwood, green ash, sweetgum.
52----------------- Una	2w6	Slight	Moderate	Severe	Sweetgum--------------- Eastern cottonwood----- Green ash-------------- Cherrybark oak---------- Nuttall oak------------ Water oak-------------- Willow oak------------- Water tupelo-----------	90 85 75 90 95 90 90 80	Sweetgum, green ash, Nuttall oak, water tupelo.

*See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT POTENTIAL

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
Alaga:												
1	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.	---
Bowie:												
2, 3	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	---
Briley:												
4	Poor	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.	---
[1]5:												
Briley part	Poor	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.	---
Alaga part	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.	---
Demopolis:												
6	Poor	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.	---
Desha:												
7	Fair	Fair	Fair	Good	Poor	Good	Fair	Fair	Good	Good	Fair	---
Gore:												
8	Poor	Good	Good	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Guyton:												
9	Fair	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good	---
Harleston:												
10	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	---
11	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	---
Houston:												
12	Good	Good	Fair	Poor	Good	Good	Poor	Very poor.	Good	Good	Very poor.	---
13	Fair	Good	Fair	Poor	Good	Fair	Poor	Very poor.	Fair	Good	Very poor.	---
Kipling:												
14	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair	---
15	Fair	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor	---
Kirvin:												
16	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	---
17	Poor	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	---
Latanier:												
18	Fair	Fair	Fair	Good	Good	Good	Good	Good	Fair	Good	Good	---
19	Poor	Fair	Fair	Good	Good	Good	Good	Good	Fair	Good	Good	---

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT POTENTIAL--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
Marietta:												
20	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
Mayhew:												
21	Poor	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	---
McKamie:												
22, 23	Fair	Good	Good	Good	Fair	Good	Very poor.	Very poor.	Good	Fair	Very poor.	---
Millwood:												
24	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	---
Oklared:												
25, 26	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	---
Oktibbeha:												
27, 28	Fair	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	---
[1]29:												
Oktibbeha part	Fair	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	---
Saffell part	Poor	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Ora:												
30	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	---
Ouachita:												
31	Good	Good	Good	Good	Good	Good	Good	Fair	Good	Good	Fair	---
Perry:												
32	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	---
Portland:												
33	Fair	Fair	Fair	Good	Fair	Fair	Good	Good	Fair	Good	Good	---
Ruston:												
34	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	---
Sacul:												
35, 36	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	---
[1]37:												
Sacul part	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	---
Kirvin part	Poor	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	---
Saffell:												
38, 39	Fair	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Sardis:												
40	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair	---
Savannah:												
41	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	---

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Alaga:					
1	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight.
Bowie:					
2, 3	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Moderate: low strength.
Briley:					
4	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.
[1]5:					
Briley part	Severe: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: slope.
Alaga part	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Demopolis:					
6	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, slope.	Moderate: depth to rock.
Desha:					
7	Severe: floods, wetness, too clayey.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, low strength, shrink-swell.
Gore:					
8	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
Guyton:					
9	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Harleston:					
10, 11	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Slight.
Houston:					
12, 13	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, corrosive, low strength.	Severe: shrink-swell, low strength.
Kipling:					
14, 15	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength, corrosive.	Severe: shrink-swell, low strength.
Kirvin:					
16, 17	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Severe: low strength.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Latanier:					
18, 19	Severe: floods, wetness, too clayey.	Severe: floods, shrink-swell, wetness.	Severe: floods, shrink-swell, wetness.	Severe: floods, shrink-swell, wetness.	Severe: shrink-swell, low strength.
Marietta:					
20	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, low strength.
Mayhew:					
21	Severe: too clayey, shrink-swell, wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, low strength.	Severe: low strength, shrink-swell, wetness.
McKamie:					
22	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
23	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: low strength, shrink-swell.
Millwood:					
24	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
Oklared:					
25	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Moderate: low strength.
26	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: low strength, floods.
Oktibbeha:					
27	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
28	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell.
[1]29:					
Oktibbeha part	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell.
Saffell part	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ora:					
30	Slight	Moderate: low strength.	Moderate: low strength.	Moderate: low strength, slope.	Moderate: low strength.
Ouachita:					
31	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Perry:					
32	Severe: wetness, too clayey, floods.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: wetness, shrink-swell, floods.
Portland:					
33	Severe: floods, too clayey, wetness.	Severe: floods, low strength, shrink-swell.	Severe: floods, low strength, shrink-swell.	Severe: floods, low strength, shrink-swell.	Severe: floods, low strength, shrink-swell.
Ruston:					
34	Slight	Slight	Slight	Slight	Moderate: low strength.
Sacul:					
35	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
36	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: low strength, shrink-swell.
[1]37:					
Sacul part	Severe: too clayey, slope.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell, slope.	Severe: slope, low strength, shrink-swell.	Severe: low strength, shrink-swell, slope.
Kirvin part	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Severe: low strength.
Saffell:					
38	Severe: small stones.	Slight	Slight	Moderate: slope.	Slight.
39	Severe: small stones.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Sardis:					
40	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, low strength.
Savannah:					
41	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, corrosive.	Moderate: low strength.
42	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope, corrosive.	Moderate: low strength.
Sawyer:					
43, 44	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell, wetness.	Severe: low strength, shrink-swell, wetness.	Severe: low strength, shrink-swell.
Smithdale:					
45	Slight	Slight	Slight	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Smithton:					
46	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Sterlington:					
47	Slight	Slight	Slight	Slight	Moderate: low strength.
Sumter:					
48	Severe: depth to rock, too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: slope, shrink-swell, low strength.	Severe: shrink-swell, low strength.
Terouge:					
49	Severe: wetness, floods, too clayey.	Severe: wetness, floods, shrink-swell.	Severe: wetness, floods, shrink-swell.	Severe: wetness, floods, shrink-swell.	Severe: floods, low strength, shrink-swell.
Trebloc:					
50	Severe: floods, wetness.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: floods, wetness, low strength.
Tuscumbia:					
51	Severe: wetness, floods.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.
Una:					
52	Severe: wetness, floods, too clayey.	Severe: wetness, floods, shrink-swell.	Severe: wetness, floods, shrink-swell.	Severe: floods, wetness, low strength.	Severe: wetness, shrink-swell, floods.

[1]This map unit is made up of two or more dominant kinds of soil. See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," and "fair." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Alaga:					
1	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Bowie:					
2, 3	Severe: percs slowly.	Moderate: seepage.	Slight	Slight	Good.
Briley:					
4	Slight	Moderate: seepage.	Slight	Slight	Fair: too sandy.
15[1]:					
Briley part	Severe: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: slope.
Alaga part	Moderate: slope.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Demopolis:					
6	Severe: percs slowly, depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: thin layer, small stones, slope.
Desha:					
7	Severe: floods, percs slowly, wetness.	Severe: floods.	Severe: floods, too clayey, wetness.	Severe: floods, wetness.	Poor: too clayey.
Gore:					
8	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
Guyton:					
9	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Harleston:					
10, 11	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Good.
Houston:					
12, 13	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
Kipling:					
14	Severe: percs slowly.	Slight	Severe: too clayey.	Moderate: wetness.	Poor: too clayey.
15	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey.
Kirvin:					
16	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
17	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Latanier:					
18, 19	Severe: floods, percs slowly, wetness.	Severe: floods.	Severe: floods, wetness, too clayey.	Severe: floods, wetness.	Poor: too clayey.
Marietta:					
20	Severe: floods, wetness.	Moderate: seepage, floods.	Severe: floods, wetness.	Severe: floods, wetness.	Good.
Mayhew:					
21	Severe: percs slowly, wetness.	Slight	Severe: too clayey, shrink-swell, wetness.	Severe: wetness.	Poor: wetness, too clayey.
McKamie:					
22	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
23	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
Millwood:					
24	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
Oklared:					
25	Severe: wetness.	Severe: wetness, seepage.	Severe: seepage.	Severe: seepage.	Good.
26	Severe: wetness, floods.	Severe: wetness, seepage, floods.	Severe: seepage, floods.	Severe: floods, seepage.	Good.
Oktibbeha:					
27	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
28	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
[1]29:					
Oktibbeha part	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
Saffell part	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope, small stones.
Ora:					
30	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.
Ouachita:					
31	Severe: floods, percs slowly.	Severe: floods.	Severe: floods.	Severe: floods.	Fair: too clayey.
Perry:					
32	Severe: percs slowly, wetness, floods.	Severe: floods.	Severe: wetness, too clayey, floods.	Severe: wetness, floods.	Poor: wetness, too clayey.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Portland:					
33	Severe: floods, percs slowly, wetness.	Severe: floods.	Severe: floods, too clayey, wetness.	Severe: floods, wetness.	Poor: too clayey.
Ruston:					
34	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
Sacul:					
35	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
36	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
[1]37:					
Sacul part	Severe: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Severe: slope.	Poor: slope, too clayey.
Kirvin part	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey.
Saffell:					
38	Slight	Moderate: slope, seepage.	Slight	Slight	Poor: small stones.
39	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.	Poor: small stones.
Sardis:					
40	Severe: floods, wetness.	Severe: wetness, floods.	Severe: floods, wetness.	Severe: floods, wetness.	Good.
Savannah:					
41, 42	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.
Sawyer:					
43, 44	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Fair: too clayey, thin layer.
Smithdale:					
45	Slight	Severe: seepage, slope.	Slight	Slight	Good.
Smithton:					
46	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Sterlington:					
47	Slight	Moderate: seepage.	Slight	Slight	Good.
Sumter:					
48	Severe: percs slowly, depth to rock.	Severe: slope, percs slowly, depth to rock.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Terouge: 49	Severe: percs slowly, floods.	Severe: floods.	Severe: floods, too clayey.	Severe: floods.	Poor: too clayey.
Trebloc: 50	Severe: wetness, floods, percs slowly.	Slight	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Tuscumbia: 51	Severe: percs slowly, floods.	Severe: wetness, floods.	Severe: wetness, too clayey, floods.	Severe: wetness, floods.	Poor: wetness, too clayey.
Una: 52	Severe: floods, percs slowly, wetness.	Severe: wetness, floods.	Severe: wetness, floods, too clayey.	Severe: wetness, too clayey, floods.	Poor: wetness, too clayey.

[1]This map unit is made up of two or more dominant kinds of soil. See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Alaga:				
1	Good	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy.
Bowie:				
2, 3	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Briley:				
4	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Fair: too sandy.
15:				
Briley part	Fair: low strength, slope.	Poor: excess fines.	Unsuited: excess fines.	Poor: slope.
Alaga part	Good	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy.
Demopolis:				
6	Fair: shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, small stones.
Desha:				
7	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Gore:				
8	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Guyton:				
9	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Harleston:				
10, 11	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Houston:				
12, 13	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Kipling:				
14, 15	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Kirvin:				
16, 17	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Latanier:				
18, 19	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Marietta:				
20	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey, thin layer.
Mayhew:				
21	Poor: shrink-swell, wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.
McKamie:				
22, 23	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Millwood:				
24	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Oklared:				
25, 26	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Oktibbeha:				
27, 28	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
[1]29:				
Oktibbeha part	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Saffell part	Fair: slope.	Poor: excess fines.	Fair: excess fines.	Poor: slope, small stones.
Ora:				
30	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
Ouachita:				
31	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Perry:				
32	Poor: wetness, low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, too clayey.
Portland:				
33	Severe: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Ruston:				
34	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Sacul:				
35, 36	Severe: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Sacul:				
[1]37:				
Sacul part	Severe: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey, slope.
Kirvin part	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Saffell: 38, 39	Good	Poor: excess fines.	Fair: excess fines.	Poor: small stones.
Sardis: 40	Fair: wetness, low strength.	Poor: excess fines.	Poor: excess fines.	Good.
Savannah: 41, 42	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Sawyer: 43, 44	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
Smithdale: 45	Good	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Smithton: 46	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Sterlington: 47	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Sumter: 48	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Terouge: 49	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Trebloc: 50	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Tuscumbia: 51	Poor: shrink-swell, low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, too clayey.
Una: 52	Poor: wetness, shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.

[1]This map unit is made up of two or more dominant kinds of soil. See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Alaga:							
1	Severe: seepage.	Moderate: piping, seepage, unstable fill.	Severe: no water.	Not needed	Droughty, fast intake, seepage.	Erodes easily, too sandy.	Droughty, erodes easily.
Bowie:							
2, 3	Moderate: seepage.	Moderate: low strength, piping.	Severe: deep to water.	Complex slope	Complex slope	Favorable	Favorable.
Briley:							
4	Moderate: seepage.	Moderate: piping, low strength.	Severe: no water.	Not needed	Fast intake, slope.	Too sandy, piping, slope.	Droughty, erodes easily, slope.
[1]5:							
Briley part	Moderate: seepage.	Moderate: piping, low strength.	Severe: no water.	Not needed	Fast intake, slope.	Too sandy, piping, slope.	Droughty, erodes easily, slope.
Alaga part	Severe: seepage.	Moderate: piping, seepage, unstable fill.	Severe: no water.	Not needed	Droughty, fast intake, seepage.	Erodes easily, too sandy.	Droughty, erodes easily.
Demopolis:							
6	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Not needed	Erodes easily, rooting depth, slope.	Depth to rock, erodes easily, slope.	Erodes easily, rooting depth, slope.
Desha:							
7	Slight	Severe: unstable fill, compressible, low strength.	Severe: no water.	Floods, wetness, percs slowly.	Floods, slow intake.	Wetness, percs slowly.	Wetness, percs slowly.
Gore:							
8	Slight	Moderate: low strength, shrink-swell.	Severe: no water.	Not needed	Slope, percs slowly, erodes easily.	Erodes easily, percs slowly.	Favorable.
Guyton:							
9	Slight	Moderate: erodes easily, low strength, compressible.	Severe: no water.	Cutbanks cave, floods, percs slowly.	Percs slowly	Not needed	Wetness.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Harleston: 10, 11	Moderate: seepage.	Moderate: piping.	Severe: no water.	Slope	Favorable	Favorable	Favorable.
Houston: 12, 13	Slight	Severe: compressible.	Severe: no water.	Not needed	Percs slowly, slow intake.	Percs slowly, erodes easily.	Favorable.
Kipling: 14, 15	Slight	Moderate: unstable fill.	Severe: no water.	Percs slowly, slope.	Slow intake, slope.	Percs slowly, slope.	Percs slowly, slope.
Kirvin: 16, 17	Moderate: seepage.	Moderate: unstable fill, low strength.	Severe: no water.	Not needed	Complex slope	Complex slope, erodes easily.	Favorable.
Latanier: 18, 19	Slight	Moderate: shrink-swell, low strength, compressible.	Severe: no water.	Floods	Floods	Not needed	Favorable.
Marietta: 20	Moderate: seepage.	Moderate: compressible, piping.	Moderate: deep to water.	Floods, wetness.	Wetness	Wetness	Wetness.
Mayhew: 21	Slight	Moderate: hard to pack, shrink-swell, low strength.	Severe: no water.	Percs slowly, wetness, slope.	Percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, wetness.
McKamie: 22	Slight	Moderate: shrink-swell, low strength, compressible.	Severe: no water.	Not needed	Slope, erodes easily, slow intake.	Erodes easily, percs slowly.	Favorable.
23	Slight	Moderate: shrink-swell, low strength, compressible.	Severe: no water.	Not needed	Slope, erodes easily, slow intake.	Slope, erodes easily, percs slowly.	Slope.
Millwood: 24	Slight	Moderate: unstable fill, compressible.	Severe: no water.	Not needed	Slope	Complex slope, percs slowly.	Erodes easily, percs slowly, slope.
Oklared: 25	Severe: seepage.	Moderate: unstable fill, piping.	Moderate: deep to water.	Not needed	Favorable	Not needed	Not needed.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Oklared: 26	Severe: seepage.	Moderate: unstable fill, piping.	Moderate: deep to water.	Not needed	Floods	Not needed	Not needed.
Oktibbeha: 27, 28	Slight	Moderate: low strength, shrink-swell, unstable fill.	Severe: no water.	Not needed	Slow intake, percs slowly, slope.	Percs slowly, slope, erodes easily.	Percs slowly, slope, erodes easily.
[1]29: Oktibbeha part	Slight	Moderate: low strength, shrink-swell, unstable fill.	Severe: no water.	Not needed	Slow intake, percs slowly, slope.	Percs slowly, slope, erodes easily.	Percs slowly, slope, erodes easily.
Saffell part	Moderate: seepage.	Moderate: seepage, piping, thin layer.	Severe: no water.	Not needed	Droughty, fast intake, slope.	Erodes easily, slope, small stones.	Droughty, erodes easily, slope.
Ora: 30	Moderate: seepage.	Moderate: piping.	Severe: no water.	Percs slowly	Percs slowly	Favorable	Rooting depth.
Ouachita: 31	Moderate: seepage.	Moderate: compressible, piping.	Severe: no water.	Not needed	Favorable	Not needed	Not needed.
Perry: 32	Slight	Moderate: shrink-swell, low strength, compressible.	Severe: no water.	Floods, percs slowly.	Floods, slow intake, wetness.	Not needed	Wetness.
Portland: 33	Slight	Moderate: compressible, low strength, unstable fill.	Severe: no water.	Percs slowly, wetness.	Slow intake, wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Ruston: 34	Moderate: seepage.	Slight	Severe: no water.	Not needed	Slope	Favorable	Favorable.
Sacul: 35, 36	Slight	Moderate: compressible, low strength.	Severe: no water.	Not needed	Erodes easily, slow intake, slope.	Slope, erodes easily, percs slowly.	Erodes easily, percs slowly, slope.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Sacul:							
[1]37:							
Sacul part	Slight	Moderate: compressible, low strength.	Severe: no water.	Not needed	Erodes easily, slow intake, slope.	Slope, erodes easily, percs slowly.	Erodes easily, percs slowly, slope.
Kirvin part	Moderate: seepage.	Moderate: unstable fill, low strength.	Severe: no water.	Not needed	Complex slope	Complex slope, erodes easily.	Favorable.
Saffell: 38, 39	Moderate: seepage.	Moderate: seepage, piping, thin layer.	Severe: no water.	Not needed	Droughty, fast intake, slope.	Erodes easily, slope, small stones.	Droughty, erodes easily, slope.
Sardis: 40	Moderate: seepage.	Moderate: piping, wetness.	Moderate: deep to water, slow refill.	Floods	Floods, wetness, erodes easily.	Wetness	Wetness.
Savannah: 41, 42	Moderate: seepage.	Moderate: low strength, piping.	Severe: deep to water.	Percs slowly, slope.	Percs slowly	Percs slowly, erodes easily.	Percs slowly.
Sawyer: 43, 44	Slight	Moderate: low strength, compressible.	Severe: no water.	Not needed	Slow intake, slope.	Favorable	Favorable.
Smithdale: 45	Severe: seepage.	Moderate: piping, unstable fill.	Severe: no water.	Not needed, slope.	Fast intake, seepage, complex slope.	Favorable	Favorable.
Smithton: 46	Moderate: seepage.	Moderate: unstable fill, piping.	Severe: no water.	Wetness	Wetness	Wetness	Wetness.
Sterlington: 47	Moderate: seepage.	Moderate: compressible, piping, erodes easily.	Severe: no water.	Not needed	Favorable	Not needed	Erodes easily.
Sumter: 48	Slight	Moderate: shrink-swell, low strength, compressible.	Severe: deep to water.	Not needed	Slow intake, percs slowly, slope.	Complex slope, depth to rock, percs slowly.	Favorable.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Terouge: 49	Slight	Severe: unstable fill, compressible.	Severe: no water.	Wetness, percs slowly, floods.	Slow intake, wetness, floods.	Not needed	Not needed.
Trebloc: 50	Slight	Moderate: piping, wetness.	Severe: deep to water.	Percs slowly, wetness, floods.	Slow intake, wetness, floods.	Not needed	Wetness, percs slowly.
Tuscumbia: 51	Slight	Moderate: unstable fill.	Severe: deep to water, slow refill.	Floods, percs slowly.	Floods, percs slowly.	Not needed	Percs slowly, wetness.
Una: 52	Slight	Moderate: compressible.	Severe: deep to water.	Wetness, floods.	Wetness, slow intake.	Wetness, percs slowly.	Percs slowly, wetness.

[1]This map unit is made up of two or more dominant kinds of soil. See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 14.--RECREATIONAL DEVELOPMENT

[Some of the terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Alaga:				
1	Moderate: too sandy.	Moderate: too sandy.	Severe: too sandy.	Moderate: too sandy.
Bowie:				
2, 3	Slight	Slight	Moderate: slope.	Slight.
Briley:				
4	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.
[1]5:				
Briley part	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.
Alaga part	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope, slope.	Moderate: too sandy.
Demopolis:				
6	Moderate: too clayey, slope.	Moderate: too clayey, slope.	Severe: depth to rock.	Moderate: too clayey.
Desha:				
7	Severe: wetness, percs slowly, too clayey.	Severe: too clayey.	Severe: wetness, percs slowly, too clayey.	Severe: too clayey.
Gore:				
8	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight.
Guyton:				
9	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Harleston:				
10	Slight	Slight	Moderate: slope.	Slight.
11	Slight	Slight	Severe: slope.	Slight.
Houston:				
12	Severe: percs slowly, too clayey.	Severe: too clayey.	Severe: percs slowly, too clayey.	Severe: too clayey.
13	Severe: percs slowly, too clayey.	Severe: too clayey.	Severe: slope, percs slowly, too clayey.	Severe: too clayey.

See footnote at end of table.

TABLE 14.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Kipling:				
14, 15	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: percs slowly, wetness.	Moderate: wetness.
Kirvin:				
16	Moderate: percs slowly.	Slight	Severe: slope.	Slight.
17	Moderate: percs slowly.	Moderate: slope.	Severe: slope.	Slight.
Latanier:				
18, 19	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Marietta:				
20	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.
Mayhew:				
21	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, percs slowly.	Severe: wetness.
McKamie:				
22	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
23	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Slight.
Millwood:				
24	Severe: percs slowly.	Slight	Severe: percs slowly.	Slight.
Oklared:				
25	Slight	Slight	Slight	Slight.
26	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
Oktibbeha:				
27, 28	Severe: too clayey, percs slowly.	Severe: too clayey.	Severe: too clayey, percs slowly, slope.	Severe: too clayey.
[1]29:				
Oktibbeha part	Severe: too clayey, percs slowly.	Severe: too clayey.	Severe: too clayey, percs slowly, slope.	Severe: too clayey.
Saffell part	Severe: small stones.	Severe: slope.	Severe: small stones, slope.	Moderate: small stones, slope.
Ora:				
30	Slight	Slight	Severe: slope.	Slight.
Ouachita:				
31	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.

See footnote at end of table.

TABLE 14.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Perry:				
32	Severe: floods, wetness, too clayey.	Severe: floods, wetness, too clayey.	Severe: floods, wetness, too clayey.	Severe: floods, wetness, too clayey.
Portland:				
33	Severe: percs slowly, too clayey, wetness.	Severe: wetness.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey.
Ruston:				
34	Slight	Slight	Moderate: slope.	Slight.
Sacul:				
35	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
36	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
[1]37:				
Sacul part	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
Kirvin part	Moderate: percs slowly.	Moderate: slope.	Severe: slope.	Slight.
Saffell:				
38	Severe: small stones.	Moderate: small stones.	Severe: small stones, slope.	Moderate: small stones.
39	Severe: small stones.	Moderate: small stones.	Severe: small stones, slope.	Moderate: small stones.
Sardis:				
40	Severe: floods, wetness.	Moderate: floods, wetness.	Severe: floods, wetness.	Moderate: floods, wetness.
Savannah:				
41	Slight	Slight	Moderate: slope.	Slight.
42	Slight	Slight	Severe: slope.	Slight.
Sawyer:				
43, 44	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
Smithdale:				
45	Slight	Slight	Severe: slope.	Slight.
Smithton:				
46	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Sterlington:				
47	Slight	Slight	Slight	Slight.

See footnote at end of table.

TABLE 14.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Sumter: 48	Severe: too clayey.	Severe: too clayey.	Severe: slope, too clayey.	Severe: too clayey.
Terouge: 49	Severe: percs slowly, too clayey.	Severe: too clayey.	Severe: percs slowly, too clayey.	Severe: too clayey.
Trebloc: 50	Severe: floods.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Tuscumbia: 51	Severe: wetness, floods, percs slowly.	Severe: wetness, floods.	Severe: wetness, floods, percs slowly.	Severe: wetness, floods.
Una: 52	Severe: wetness, floods, percs slowly.	Severe: wetness, floods, too clayey.	Severe: wetness, floods, percs slowly.	Severe: wetness, floods, too clayey.

[1]This map unit is made up of two or more dominant kinds of soil. See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
1-------------------- Alaga	0-9	Fine sand--------	SM, SW-SM	A-2, A-3	0	100	100	40-70	5-35	---	NP
	9-80	Loamy sand, loamy fine sand, fine sand.	SM, SW-SM	A-2, A-3	0	100	100	50-80	5-35	---	NP
2, 3---------------- Bowie	0-16	Fine sandy loam	SM, SM-SC, ML	A-2-4, A-4	0	98-100	98-100	95-100	35-55	<25	NP-6
	16-72	Sandy clay loam, clay loam, fine sandy loam.	SC, CL	A-4, A-6	0	90-100	90-100	85-100	40-55	20-40	8-22
4-------------------- Briley	0-31	Loamy fine sand	SM	A-2-4, A-4	0	97-100	95-100	80-98	17-45	<25	NP-4
	31-80	Fine sandy loam, sandy clay loam.	SC, CL	A-4, A-6	0	95-100	95-100	85-98	36-55	22-39	8-22
5*:											
Briley-------------	0-31	Loamy fine sand	SM	A-2-4, A-4	0	97-100	95-100	80-98	17-45	<25	NP-4
	31-80	Fine sandy loam, sandy clay loam.	SC, CL	A-4, A-6	0	95-100	95-100	85-98	36-55	22-39	8-22
Alaga--------------	0-9	Fine sand--------	SM, SW-SM	A-2, A-3	0	100	100	40-70	5-35	---	NP
	9-80	Loamy sand, loamy fine sand, fine sand.	SM, SW-SM	A-2, A-3	0	100	100	50-80	5-35	---	NP
6-------------------- Demopolis	0-4	Silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	85-100	75-90	65-85	50-80	24-44	6-20
	4-10	Gravelly loam, gravelly clay loam, very gravelly silty clay loam.	GM, GC, GM-GC, GP-GM	A-2	0	20-30	15-25	10-20	8-15	18-38	4-14
	10-14	Weathered bedrock.	---	---	---	---	---	---	---	---	---
7-------------------- Desha	0-4	Clay--------------	CH	A-7	0	100	100	95-100	95-100	55-80	35-60
	4-72	Silty clay, clay	CH	A-7	0	100	100	95-100	95-100	60-85	40-65
8-------------------- Gore	0-8	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	60-90	<27	NP-7
	8-72	Clay, silty clay	CH	A-7-6	0	100	100	95-100	85-100	53-65	28-40
9-------------------- Guyton	0-16	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	65-90	<27	NP-7
	16-72	Silt loam, silty clay loam, loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	65-95	<40	NP-18
10, 11-------------- Harleston	0-7	Loamy fine sand	ML, CL-ML	A-4	0	90-100	85-100	85-95	60-70	<25	NP-7
	7-72	Sandy loam, loam, fine sandy loam.	SC, CL, CL-ML, SM-SC	A-2, A-4	0	90-100	85-100	60-95	30-70	20-30	5-10
12, 13-------------- Houston	0-22	Clay--------------	CH, MH	A-7	0	100	100	95-100	90-95	50-68	23-37
	22-72	Clay--------------	CH, MH	A-7	0	100	100	95-100	95-98	55-70	25-45
14------------------- Kipling	0-6	Loam-------------	CL, ML	A-6, A-4, A-7	0	100	100	90-100	70-95	20-45	8-25
	6-72	Silty clay, clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	95-100	85-95	38-70	22-45

See footnote at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
15 Kipling	0-7	Silty clay loam	CL	A-6, A-4, A-7	0	100	100	90-100	70-95	20-45	8-25
	7-72	Silty clay, clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	95-100	85-95	38-70	22-45
16, 17 Kirvin	0-5	Fine sandy loam	SM, SM-SC	A-4	0-2	75-100	75-95	65-90	36-50	<25	NP-4
	5-72	Clay, sandy clay, clay loam.	CH, MH, CL, ML	A-7	0	95-100	85-100	85-99	51-75	41-60	15-30
18, 19 Latanier	0-7	Silty clay	CH	A-7	0	100	100	100	95-100	51-75	26-45
	7-26	Clay, silty clay	CH	A-7	0	100	100	100	95-100	51-75	26-45
	26-72	Silt loam, silty clay loam, very fine sandy loam, very fine sand.	CL-ML, CL, ML	A-4, A-6	0	100	100	100	80-100	<40	NP-17
20 Marietta	0-7	Loam	ML, CL, SM	A-4	0	100	100	80-95	40-75	20-30	5-10
	7-42	Silty clay loam, sandy clay loam, loam.	CL, SC	A-6, A-4	0	100	100	85-100	45-90	25-40	8-20
	42-72	Silty clay loam, sandy clay, loam.	CL, CH, SC	A-7, A-6	0	100	100	85-100	45-90	35-55	15-30
21 Mayhew	0-6	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	36-50	15-28
	6-49	Silty clay loam, silty clay, clay.	CH, CL	A-7	0	100	100	95-100	85-95	46-75	25-50
	49-72	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	90-100	90-100	75-90	45-80	25-50
22 McKamie	0-4	Silty clay loam	CL	A-6	0	100	100	95-100	95-100	25-40	11-18
	4-38	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-100	45-70	22-40
	38-72	Silty clay loam, silt loam, very fine sandy loam.	CL, CL-ML	A-4, A-6, A-7	0	100	100	95-100	50-95	25-45	5-22
23 McKamie	0-6	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	100	100	90-100	40-60	25	NP-5
	6-40	Clay, silty clay	CH, CL	A-7-6	0	100	100	95-100	85-100	45-70	22-40
	40-72	Silty clay loam, silt loam, very fine sandy loam.	CL, CL-ML	A-4, A-6, A-7	0	100	100	95-100	50-95	25-45	5-22
24 Millwood	0-7	Silt loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	95-100	90-100	45-80	<25	NP-7
	7-72	Clay	CH	A-7	0	95-100	95-100	95-100	85-95	55-80	30-50
25, 26 Oklared	0-8	Very fine sandy loam.	SM, SC, ML, CL	A-4	0	100	98-100	94-100	36-60	<30	NP-10
	8-72	Fine sandy loam, very fine sandy loam, loam.	SM, SC, ML, CL	A-4	0	100	98-100	94-100	36-60	<30	NP-10
27 Oktibbeha	0-4	Silty clay loam	ML, CL	A-7, A-6	0	100	95-100	95-100	85-90	40-45	12-25
	4-43	Clay, silty clay	CL	A-7	0	100	95-100	95-100	90-100	41-49	25-30
28 Oktibbeha	0-4	Clay	ML, CL	A-7, A-6	0	100	95-100	95-100	85-90	40-45	12-25
	4-43	Clay, silty clay	CL	A-7	0	100	95-100	95-100	90-100	41-49	25-30

See footnote at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
29*:											
Oktibbeha----------	0-7	Clay-------------	ML, CL	A-7, A-6	0	100	95-100	95-100	85-90	40-45	12-25
	7-43	Clay, silty clay	CL	A-7	0	100	95-100	95-100	90-100	41-49	25-30
Saffell------------	0-6	Gravelly fine sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	6-48	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	48-72	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
30----------------- Ora	0-8	Fine sandy loam	SM-SC, SM, ML, CL-ML	A-4, A-2	0	100	95-100	65-85	30-65	<30	NP-5
	8-28	Clay loam, sandy clay loam, loam.	CL, ML	A-6, A-4, A-7	0	100	95-100	80-100	50-80	25-48	8-22
	28-72	Sandy clay loam, loam, sandy loam.	CL	A-6, A-7, A-4	0	100	95-100	80-100	50-75	25-43	8-25
31----------------- Ouachita	0-19	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	75-95	<30	NP-12
	19-72	Silt loam, loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-100	80-100	25-40	5-20
32----------------- Perry	0-6	Clay-------------	CH, CL	A-7	0	100	100	100	95-100	45-75	22-45
	6-35	Clay-------------	CH	A-7	0	100	100	100	95-100	60-80	33-50
	35-72	Clay-------------	CH, CL	A-7	0	90-100	85-100	75-100	70-100	45-80	22-50
33----------------- Portland	0-15	Clay-------------	CH	A-7	0	100	100	95-100	95-100	55-80	35-55
	15-72	Clay-------------	CH	A-7	0	100	100	95-100	95-100	60-90	40-60
34----------------- Ruston	0-9	Fine sandy loam	SM, ML	A-4, A-2	0	85-100	78-100	65-100	30-75	<20	NP-3
	9-87	Sandy clay loam, loam, clay loam, fine sandy loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-40	11-18
	87-98	Fine sandy loam, sandy loam.	SM, ML, CL-ML, SM-SC	A-4, A-2	0	85-100	78-100	65-100	30-75	<27	NP-7
35, 36------------- Sacul	0-5	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	5-72	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
37*:											
Sacul--------------	0-5	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	5-72	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
Kirvin-------------	0-5	Fine sandy loam	SM, SM-SC	A-4	0-2	75-100	75-95	65-90	36-50	<25	NP-4
	5-72	Clay, sandy clay, clay loam.	CH, MH, CL, ML	A-7	0	95-100	85-100	85-99	51-75	41-60	15-30

See footnote at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
38, 39----------- Saffell	0-6	Gravelly fine sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	6-48	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	48-72	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
40--------------- Sardis	0-56	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	80-100	75-95	<30	NP-10
	56-72	Loam, silt loam, sandy loam.	ML, SM, CL, SC	A-4, A-2	0	100	95-100	60-95	35-75	<30	NP-10
41, 42----------- Savannah	0-9	Fine sandy loam	SM, ML	A-2-4, A-4	0	100	100	60-85	30-55	<25	NP-4
	9-25	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	0	100	100	80-100	40-80	23-40	7-19
	25-72	Loam, clay loam, sandy clay loam, fine sandy loam.	CL, SC, CL-ML	A-4, A-6, A-7	0	100	100	80-100	40-80	23-43	7-19
43, 44----------- Sawyer	0-6	Loam-------------	ML, CL-ML	A-4	0	100	95-100	85-95	60-90	<25	NP-7
	6-29	Silty clay loam, loam, silt loam.	CL	A-6, A-4	0	100	95-100	85-95	70-90	30-40	10-20
	29-72	Silty clay, clay	CH, CL	A-7	0	100	95-100	90-100	80-90	45-60	20-35
45--------------- Smithdale	0-7	Fine sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	7-72	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
46--------------- Smithton	0-7	Fine sandy loam	ML, SM	A-2, A-4	0	95-100	95-100	60-95	30-65	---	NP
	7-72	Fine sandy loam, loam.	ML, CL-ML	A-4	0	95-100	95-100	85-95	55-80	15-25	2-7
47--------------- Sterlington	0-15	Very fine sandy loam.	ML	A-4	0	100	100	90-100	60-95	<23	NP-3
	15-59	Silt loam, very fine sandy loam, loam.	CL-ML, ML	A-4	0	100	100	90-100	80-95	<28	NP-7
	59-72	Fine sand--------	SM	A-4	0	100	100	65-80	20-35	---	NP
48--------------- Sumter	0-4	Clay-------------	CL, ML	A-7	0	99-100	99-100	98-100	85-90	41-50	16-25
	4-27	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	99-100	99-100	90-95	41-55	16-32
	27-50	Weathered bedrock.	CH, CL	A-7	0	100	100	99-100	75-90	41-60	16-34
49--------------- Terouge	0-72	Silty clay-------	CH	A-7	0	100	95-100	95-100	80-100	60-90	35-60

See footnote at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
50----------------- Trebloc	0-7	Silt loam--------	ML, CL-ML	A-4	0	100	100	85-100	60-90	<30	NP-7
	7-42	Silt loam, silty clay loam, loam.	CL	A-4, A-6	0	100	100	85-100	85-100	25-40	8-16
	42-72	Silty clay loam, silty clay, clay loam.	CL	A-6, A-7	0	100	100	85-100	85-100	30-48	12-21
51----------------- Tuscumbia	0-8	Clay--------------	CL, CN	A-7, A-6	0	100	100	90-100	75-90	35-50	15-25
	8-72	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	95-100	80-95	51-75	30-50
52----------------- Una	0-7	Silty clay loam	CH, CL	A-7	0	100	100	90-100	75-95	41-65	20-40
	7-72	Clay, silty clay loam, silty clay.	CH, CL	A-7	0	100	100	90-100	75-95	41-65	20-40

*See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T
	In	In/hr	In/in	pH			
1 Alaga	0-9	>6.0	0.05-0.09	4.5-6.0	Low	0.17	5
	9-80	>6.0	0.05-0.09	4.5-6.0	Low	0.17	
2, 3 Bowie	0-16	2.0-6.0	0.10-0.15	5.1-6.5	Low	0.32	5
	16-72	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.32	
4 Briley	0-31	6.0-20	0.07-0.11	4.5-6.5	Low	0.20	5
	31-80	0.6-2.0	0.13-0.17	4.5-6.0	Low	0.24	
5*:							
Briley	0-31	6.0-20	0.07-0.11	4.5-6.5	Low	0.20	5
	31-80	0.6-2.0	0.13-0.17	4.5-6.0	Low	0.24	
Alaga	0-9	>6.0	0.05-0.09	4.5-6.0	Low	0.17	5
	9-80	>6.0	0.05-0.09	4.5-6.0	Low	0.17	
6 Demopolis	0-4	0.2-0.6	0.15-0.18	7.9-8.4	Moderate	0.37	1
	4-10	0.2-0.6	0.10-0.15	7.9-8.4	Low	0.32	
	10-14	---	---	7.9-8.4	Low	---	
7 Desha	0-4	<0.2	0.12-0.18	6.1-7.8	High	0.32	5
	4-72	<0.06	0.12-0.18	6.1-7.8	High	0.28	
8 Gore	0-8	0.6-2.0	0.20-0.22	5.1-6.0	Low	0.43	3
	8-72	<0.06	0.14-0.18	4.5-8.4	Very high	0.32	
9 Guyton	0-16	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	3
	16-72	0.06-2.0	0.15-0.22	5.1-8.4	Low	0.37	
10, 11 Harleston	0-7	0.6-6.0	0.08-0.16	4.5-5.5	Low	0.17	5
	7-72	0.6-2.0	0.13-0.16	4.5-5.5	Low	0.32	
12, 13 Houston	0-22	<0.06	0.15-0.20	6.1-8.4	Very high	0.37	4
	22-72	<0.06	0.15-0.20	6.1-8.4	Very high	0.32	
14 Kipling	0-6	0.06-0.2	0.20-0.22	3.6-6.0	Moderate	0.32	4
	6-72	0.06-0.2	0.20-0.22	3.6-8.4	Very high	0.32	
15 Kipling	0-7	0.06-0.2	0.20-0.22	3.6-6.0	Moderate	0.32	4
	7-72	0.06-0.2	0.20-0.22	3.6-8.4	Very high	0.32	
16, 17 Kirvin	0-5	2.0-6.0	0.10-0.15	5.1-7.3	Low	0.37	4
	5-72	0.2-0.6	0.12-0.18	3.6-5.5	Moderate	0.32	
18, 19 Letanier	0-7	<0.06	0.18-0.20	6.6-8.4	Very high	0.32	5
	7-26	<0.06	0.18-0.20	6.6-8.4	Very high	0.32	
	26-72	0.06-2.0	0.18-0.22	6.6-8.4	Low	0.37	
20 Marietta	0-7	0.6-2.0	0.14-0.18	5.6-7.8	Low	0.28	5
	7-42	0.6-2.0	0.14-0.20	5.6-7.8	Low	0.28	
	42-72	0.6-2.0	0.14-0.20	5.6-7.8	Moderate	0.28	
21 Mayhew	0-6	0.06-0.2	0.20-0.22	4.5-6.0	Moderate	0.37	5
	6-49	<0.06	0.18-0.20	4.5-6.0	High	0.32	
	49-72	<0.06	0.18-0.20	4.5-6.0	High	0.32	
22 McKamie	0-4	0.6-2.0	0.16-0.22	5.1-6.5	Moderate	0.37	---
	4-38	<0.06	0.18-0.20	4.5-6.0	High	0.32	
	38-72	0.2-2.0	0.14-0.22	4.5-8.4	Moderate	0.37	
23 McKamie	0-6	0.6-2.0	0.14-0.22	5.1-6.5	Low	0.43	3
	6-40	<0.06	0.18-0.20	4.5-6.0	High	0.32	
	40-72	0.2-2.0	0.14-0.22	4.5-8.4	Moderate	0.37	

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
24------------------ Millwood	0-7 7-72	0.6-2.0 <0.06	0.11-0.24 0.12-0.18	5.1-6.0 4.5-5.5	Low------------ High------------	0.49 0.37	5
25, 26------------ Oklared	0-8 8-72	2.0-6.0 2.0-6.0	0.12-0.16 0.12-0.16	7.4-8.4 7.4-8.4	Low------------ Low------------	0.32 0.32	5
27, 28------------ Oktibbeha	0-4 4-43	<0.06 <0.06	0.12-0.16 0.10-0.14	4.5-6.5 6.6-8.4	High------------ High------------	0.32 0.32	3
29*:							
Oktibbeha--------	0-7 7-43	<0.06 <0.06	0.12-0.16 0.10-0.14	4.5-6.5 6.6-8.4	High------------ High------------	0.32 0.32	3
Saffell----------	0-6 6-48 48-72	2.0-6.0 0.6-2.0 0.6-6.0	0.05-0.10 0.06-0.12 0.04-0.11	4.5-5.5 4.5-5.5 4.5-5.5	Low------------ Low------------ Low------------	0.20 0.28 0.17	4
30------------------ Ora	0-8 8-28 28-72	2.0-6.0 0.6-2.0 0.2-0.6	0.10-0.13 0.12-0.18 0.05-0.10	4.0-5.5 4.0-5.5 4.0-5.5	Low------------ Low------------ Low------------	0.32 0.37 0.32	3
31------------------ Ouachita	0-19 19-72	0.6-2.0 0.2-0.6	0.15-0.24 0.15-0.24	4.5-6.0 4.5-5.5	Low------------ Low------------	0.37 0.32	5
32------------------ Perry	0-6 6-35 35-72	<0.06 <0.06 <0.06	0.17-0.20 0.17-0.20 0.17-0.20	4.5-6.0 5.1-7.3 6.1-8.4	Very high------ Very high------ Very high------	0.24 0.28 0.28	5
33------------------ Portland	0-15 15-72	<0.06 <0.06	0.12-0.18 0.12-0.18	4.5-5.5 6.1-8.4	High------------ High------------	0.32 0.32	5
34------------------ Ruston	0-9 9-87 87-98	0.6-2.0 0.6-2.0 0.6-2.0	0.09-0.16 0.12-0.17 0.12-0.15	5.1-6.5 4.5-6.0 4.5-6.0	Low------------ Low------------ Low------------	0.32 0.28 0.32	5
35, 36------------ Sacul	0-5 5-72	0.6-2.0 0.06-0.2	0.10-0.20 0.12-0.18	4.5-5.5 4.5-5.5	Low------------ High------------	0.32 0.32	3
37*:							
Sacul------------	0-5 5-72	0.6-2.0 0.06-0.2	0.10-0.20 0.12-0.18	4.5-5.5 4.5-5.5	Low------------ High------------	0.32 0.32	3
Kirvin------------	0-5 5-72	2.0-6.0 0.2-0.6	0.10-0.15 0.12-0.18	5.1-7.3 3.6-5.5	Low------------ Moderate--------	0.37 0.32	4
38, 39------------ Saffell	0-6 6-48 48-72	2.0-6.0 0.6-2.0 0.6-6.0	0.05-0.10 0.06-0.12 0.04-0.11	4.5-5.5 4.5-5.5 4.5-5.5	Low------------ Low------------ Low------------	0.20 0.28 0.17	4
40------------------ Sardis	0-56 56-72	0.6-2.0 0.6-2.0	0.15-0.24 0.10-0.24	4.5-6.0 4.5-6.0	Low------------ Low------------	0.37 0.37	5
41, 42------------ Savannah	0-9 9-25 25-72	0.6-2.0 0.6-2.0 0.2-0.6	0.10-0.15 0.13-0.20 0.05-0.10	4.0-5.5 4.0-5.5 4.0-5.5	Low------------ Low------------ Low------------	0.24 0.28 0.24	3
43, 44------------ Sawyer	0-6 6-29 29-72	0.6-2.0 0.2-0.6 0.06-0.2	0.15-0.24 0.15-0.24 0.12-0.18	4.5-5.5 4.5-5.5 4.5-5.5	Low------------ Moderate-------- High------------	0.43 0.37 0.32	3
45------------------ Smithdale	0-7 7-72	2.0-6.0 0.6-2.0	0.14-0.16 0.15-0.17	4.5-5.5 4.5-5.5	Low------------ Low------------	0.28 0.24	5
46------------------ Smithton	0-7 7-72	0.6-2.0 0.2-0.6	0.10-0.2 0.11-0.2	4.5-5.5 4.5-5.5	Low------------ Low------------	0.32 0.32	5

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
47----------------- Sterlington	0-15	0.6-2.0	0.18-0.22	4.5-6.0	Low--------------	0.37	5
	15-59	0.6-2.0	0.18-0.22	5.1-6.5	Low--------------	0.37	
	59-72	6.0-20.0	0.05-0.08	5.1-8.4	Low--------------	0.17	
48----------------- Sumter	0-4	0.06-2.0	0.12-0.17	7.4-8.4	High-------------	0.37	3
	4-27	0.06-2.0	0.12-0.17	7.4-8.4	High-------------	0.37	
	27-50	---	---	---	-----------------	---	
49----------------- Terouge	0-72	<0.06	0.14-0.18	6.6-8.4	Very high--------	0.32	5
50----------------- Trebloc	0-7	0.6-2.0	0.16-0.20	4.5-5.5	Low--------------	0.37	3
	7-42	0.2-0.6	0.15-0.20	4.5-5.5	Moderate---------	0.37	
	42-72	0.2-0.6	0.14-0.18	4.5-5.5	Moderate---------	0.37	
51----------------- Tuscumbia	0-8	0.06-0.20	0.20-0.22	5.0-8.4	High-------------	0.28	3
	8-72	<0.06	0.18-0.20	5.0-8.4	Very high--------	0.28	
52----------------- Una	0-7	<0.06	0.15-0.20	4.5-5.5	High-------------	0.28	3
	7-72	<0.06	0.15-0.20	4.5-5.5	High-------------	0.28	

*See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

[The definitions of "flooding" and "water table" in the Glossary explain terms such as "brief," "apparent," and "perched." The symbol > means greater than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness
					Ft			In		In	
Alaga:											
1	A	None	---	---	>6.0	---	---	>60	---	---	---
Bowie:											
2, 3	B	None	---	---	>6.0	---	---	>60	---	---	---
Briley:											
4	B	None	---	---	>6.0	---	---	>60	---	---	---
[1]5:											
Briley part	B	None	---	---	>6.0	---	---	>60	---	---	---
Alaga part	A	None	---	---	>6.0	---	---	>60	---	---	---
Demopolis:											
6	C	None	---	---	>6.0	---	---	4-16	Rippable	---	---
Desha:											
7	D	None to common.	Long to very long.	Dec-Jun	0-1.0	Perched	Dec-May	>60	---	---	---
Gore:											
8	D	None	---	---	>6.0	---	---	>60	---	---	---
Guyton:											
9	D	None to common.	Very brief to long.	Jan-Dec	0-1.5	Apparent	Dec-May	>60	---	---	---
Harleston:											
10, 11	C	None to occasional.	Very brief	Nov-Apr	2.0-3.0	Apparent	Nov-Mar	>60	---	---	---
Houston:											
12, 13	D	None	---	---	4.0-6.0	Apparent	Jan-Mar	48-60	Rippable	---	---
Kipling:											
14, 15	D	None	---	---	1.5-3.0	Perched	Jan-Mar	36-80	Rippable	---	---
Kirvin:											
16, 17	C	None	---	---	>6.0	---	---	40-60	Rippable	---	---
Latanier:											
18, 19	D	None to common.	Brief	Nov-Jul	1.0-3.0	Apparent	Dec-Apr	>60	---	---	---
Marietta:											
20	C	Common	Brief	Jan-Mar	2.0	Apparent	Jan-Mar	>60	---	---	---
Mayhew:											
21	D	None	---	---	0-1.0	Apparent	Jan-Mar	>60	---	---	---
McKamie:											
22, 23	D	None	---	---	>6.0	---	---	>60	---	---	---
Millwood:											
24	D	None	---	---	>6.0	---	---	>60	---	---	---

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Depth	Hard-ness
					Ft			In		In	
Oklared: 25, 26	B	Occasional	Very brief	Mar-Aug	3.0-4.0	Apparent	Mar-May	>60	---	---	---
Oktibbeha: 27, 28	D	None	---	---	>6.0	---	---	20-50	Rip-pable	---	---
[1]29: Oktibbeha part	D	None	---	---	>6.0	---	---	20-50	Rip-pable	---	---
Saffell part	B	None	---	---	>6.0	---	---	>60	---	---	---
Ora: 30	C	None	---	---	2.0-3.5	Perched	Feb-Apr	>60	---	---	---
Ouachita: 31	C	Common	Long to very long.	Dec-May	>6.0	---	---	>60	---	---	---
Perry: 32	D	None to common.	Brief to very long.	Dec-Jun	0-2.0	Apparent	Dec-Apr	>60	---	---	---
Portland: 33	D	None to common.	Long to very long.	Dec-May	0-1.0	Perched	Dec-May	>60	---	---	---
Ruston: 34	B	None	---	---	>6.0	---	---	>60	---	---	---
Sacul: 35, 36	C	None	---	---	>6.0	---	---	>60	---	---	---
[1]37: Sacul part	C	None	---	---	>6.0	---	---	>60	---	---	---
Kirvin part	C	None	---	---	>6.0	---	---	40-60	Rip-pable	---	---
Saffell: 38, 39	B	None	---	---	>6.0	---	---	>60	---	---	---
Sardis: 40	C	Common	Brief	Dec-May	1.0-3.0	Apparent	Jan-May	>60	---	---	---
Savannah: 41, 42	C	None	---	---	1.5-3.0	Perched	Jan-Mar	>60	---	---	---
Sawyer: 43, 44	C	None	---	---	2.0-3.0	Perched	Dec-Apr	>60	---	---	---
Smithdale: 45	B	None	---	---	>6.0	---	---	>60	---	---	---
Smithton: 46	D	None to occasional.	Brief to long.	Dec-May	0-1.0	Perched	Dec-May	>60	---	---	---
Sterlington: 47	B	None	---	---	>6.0	---	---	>60	---	---	---

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Depth	Hard-ness
					Ft			In		In	
Sumter: 48	C	None	---	---	>6.0	---	---	20-40	Rip-pable	---	---
Terouge: 49	D	Common	Brief to long.	Dec-May	0-1.0	Perched	Dec-Apr	>60	---	---	---
Trebloc: 50	D	None to common.	Very brief	Jan-Apr	0.5-1.0	Apparent	Jan-Apr	>60	---	---	---
Tuscumbia: 51	D	Common	Brief to long.	Jan-Mar	0.5-1.5	Apparent	Dec-Apr	>60	---	---	---
Una: 52	D	Common	Brief to long.	Jan-Mar	0.5-1.0	Apparent	Nov-Apr	>60	---	---	---

[1]This map unit is made up of two or more dominant kinds of soil. See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 18.--PHYSICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Particle-size distribution (percent less than 2.0 mm)					
			Very coarse sand through medium sand (2.0-0.25 mm)	Fine sand (0.25)-0.10 mm)	Very fine sand (0.10-0.05 mm)	Total sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)
	In							
Alaga fine sand:								
S-74-AR-057-43-(1-6)	0-9	Ap	17	72	3	92	6	2
	9-24	C1	20	62	2	84	12	4
	24-39	C2	22	61	3	86	11	3
	39-48	C3	20	63	3	86	10	4
	48-61	C4	19	61	3	83	9	8
	61-80	C5	17	63	9	89	8	3
Harleston loamy fine sand:								
S-74-AR-057-39-(1-6)	0-7	Ap	2	48	26	76	21	3
	0-7	B21t	3	40	23	66	26	8
	21-36	B22t	2	38	20	60	27	13
	36-51	B23t	2	38	22	62	24	14
	51-60	B24t	4	59	14	77	10	13
	60-72	B25t	4	56	15	75	12	13
Houston clay:								
S-70-AR-29-6-(1-6)	0-7	Ap	1	2	2	5	33	62
	7-22	A12	1	1	2	4	28	68
	22-37	AC	2	1	3	6	39	55
	37-52	AC	2	1	2	5	35	60
	52-64	C1	1	1	2	4	36	60
	64-72	C2	1	0	2	3	39	58
Kipling loam:								
S-74-AR-057-37-(1-6)	0-6	Ap	3	18	25	46	38	16
	6-20	B21t	1	7	11	19	29	52
	20-35	B22t	1	8	12	21	30	49
	35-45	B23t	1	7	14	22	31	47
	45-57	B3	1	8	13	22	30	48
	57-72	C	2	8	12	22	30	48
Ora fine sandy loam:								
S-72-AR-29-19-(1-6)	0-8	Ap	5	37	17	59	37	4
	8-19	B21t	3	21	12	36	31	33
	19-28	B22t	4	25	14	43	33	24
	28-45	Bx1	5	29	14	48	30	22
	45-58	Bx2	8	34	15	57	23	20
	58-72	Bx3	9	33	14	56	22	22
Perry clay:								
S-73-AR-29-25-(1-6)	0-7	A11	1	0	0	1	29	70
	7-22	A12	1	0	0	1	21	78
	22-35	B2g	1	0	0	1	17	82
	35-53	IIB3	0	0	0	1	20	79
	53-63	IIC1	1	1	0	2	22	76
	63-72	IIC2	1	1	0	2	22	76
Sacul very fine sandy loam:								
S-70-AR-29-8-(1-7)	0-5	A1	9	23	30	62	33	5
	5-14	B21t	4	4	9	17	32	51
	14-22	B22t	2	3	8	13	33	54
	22-36	B23t	1	1	5	7	43	50
	36-51	B24t	0	0	9	9	56	35
	51-61	B3	4	2	6	12	46	42
	61-72	B3	3	2	8	13	47	40
Sardis silt loam:								
S-73-AR-29-20-(1-6)	0-7	Ap	2	10	14	26	56	18
	7-12	B21	2	13	15	30	52	18
	12-26	B22	1	9	15	25	53	22
	26-41	B23	1	9	16	26	53	21
	41-56	B24	1	12	20	33	52	15
	56-72	C	1	13	21	35	48	17

TABLE 18.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (percent less than 2.0 mm) Very coarse sand through medium sand (2.0-0.25 mm)	Fine sand (0.25)-0.10 mm)	Very fine sand (0.10-0.05 mm)	Total sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)
	In							
Smithdale fine sandy loam:								
S-70-AR-29-5-(1-7)	0-7	Ap	4	39	19	62	35	3
	7-13	A2	4	33	15	52	38	10
	13-23	B21t	3	24	13	40	34	26
	23-37	B22t	3	25	14	42	32	26
	37-52	B23t	3	25	14	42	32	26
	52-61	B24t	3	29	14	46	35	19
	61-72	B25t	4	27	14	45	35	20
Smithton fine sandy loam:								
S-71-AR-29-11-(1-6)	0-7	A1	4	45	7	56	41	3
	7-21	B1g	4	40	6	50	42	8
	21-35	B21tg	3	39	6	48	39	13
	35-49	B22tg	4	39	6	49	35	16
	49-61	B23tg	3	37	6	46	32	22
	61-72	B24tg	4	36	5	45	28	27
Sterlington very fine sandy loam:								
S-71-AR-29-15-(1-6)	0-7	Ap	0	2	45	47	50	3
	7-15	A2	0	2	51	53	44	3
	15-30	B21t	0	1	27	28	56	16
	30-45	B22t & A'2	0	0	14	14	75	11
	45-59	B3	0	9	32	41	49	10
	59-72	C	0	49	39	88	9	3
Trebloc silt loam:								
S-73-AR-29-23-(1-7)	0-7	Ap	9	3	2	14	69	17
	7-19	B21tg	9	3	1	13	66	21
	19-32	B21tg	6	3	1	10	68	22
	32-42	B22tg	6	3	1	10	56	34
	42-52	B23tg	4	3	1	8	52	40
	52-63	B24tg	5	3	1	9	48	43
	63-72	B25tg	6	3	1	10	45	45
Tuscumbia clay:								
S-70-AR-29-4-(1-6)	0-8	Ap	2	8	5	15	29	56
	8-23	B21g	3	16	6	25	28	47
	23-33	B22g	3	18	8	29	27	44
	33-44	B23g	4	18	7	29	26	45
	44-59	B24g	4	17	7	28	23	49
	59-72	B25g	4	20	8	32	23	45
Una silty clay loam:								
S-70-AR-29-2-(1-6)	0-7	Ap	2	6	4	12	50	38
	7-17	B21g	2	8	5	15	46	39
	17-32	B22g	3	11	7	21	42	37
	32-44	B23g	1	9	6	16	35	49
	44-57	B23g	1	9	5	15	36	49
	57-72	B24g	1	9	8	18	36	46

TABLE 19.--CHEMICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable acidity	Base saturation	Reaction (1:1 soil to water)	Organic matter	Available phosphorus
	In		Meq/100 g	Meq/100 g	Meq/100 g	Meq/100 g	Meq/100 g	Pct	pH	Pct	P/m
Alaga fine sand:											
S-74-AR-057-43-(1-6)	0-9	Ap	1	0	0	0	2	31	6	0	35
	9-24	C1	1	0	0	0	2	35	6	0	19
	24-39	C2	1	0	0	0	2	48	6	0	19
	39-48	C3	1	0	0	0	2	47	6	0	17
	48-61	C4	2	0	0	0	5	32	6	0	28
	61-80	C5	1	0	0	0	2	48	6	0	14
Harleston loamy fine sand:											
S-74-AR-057-39-(1-6)	0-7	Ap	3	0	0	0	2	59	7	1	7
	7-21	B21t	2	0	0	1	6	30	6	1	4
	21-36	B22t	1	1	0	0	8	19	5	0	2
	36-51	B23t	1	1	0	0	10	16	5	0	3
	51-60	B24t	1	1	0	0	11	12	4	0	1
	60-72	B25t	1	0	0	0	12	10	4	0	2
Houston clay:											
S-70-AR-29-6-(1-6)	0-7	Ap	41	2	0	1	5	90	8	4	4
	7-22	A12	43	2	0	1	5	90	8	2	3
	22-37	AC	37	2	1	0	1	98	8	1	3
	37-52	AC	41	2	1	0	2	96	8	1	2
	52-64	C1	36	2	1	0	1	98	8	1	5
	64-72	C2	31	2	1	0	0	99	8	0	3
Kipling loam:											
S-74-AR-057-37-(1-6)	0-6	Ap	9	1	0	0	8	57	6	3	4
	6-20	B21t	16	2	0	0	24	44	5	1	1
	20-35	B22t	16	2	1	0	19	49	5	0	1
	35-45	B23t	15	2	1	0	17	52	5	0	1
	45-57	B3	15	2	1	0	10	65	6	0	1
	57-72	C	15	2	1	0	---	---	8	0	2
Ora fine sandy loam:											
S-72-AR-29-19-(1-6)	0-8	Ap	2	1	0	0	4	40	6	1	81
	8-19	B21t	4	1	0	0	7	45	5	1	5
	19-28	B22t	1	1	0	0	7	26	5	1	2
	28-45	Bx1	0	0	0	0	6	16	5	0	1
	45-58	Bx2	0	0	0	0	5	13	5	0	1
	58-72	Bx3	0	0	0	0	6	11	5	0	1
Perry clay:											
S-73-AR-29-25-(1-6)	0-7	A11	18	12	0	1	21	60	5	4	8
	7-22	A12	18	15	1	1	16	69	6	2	5
	22-35	B2g	18	20	2	1	12	78	7	2	6
	35-53	IIB3*	---	---	---	---	---	---	8	---	---
	53-63	IIC1*	---	---	---	---	---	---	8	---	---
	63-72	IIC2*	---	---	---	---	---	---	8	---	---
Saoul very fine sandy loam:											
S-70-AR-29-8-(1-7)	0-5	A1	2	1	0	0	4	40	6	2	5
	5-14	B21t	2	4	0	0	18	25	5	1	2
	14-22	B22t	1	4	0	0	22	21	5	1	2
	22-36	B23t	1	5	0	0	25	21	5	0	2
	36-51	B24t	1	7	1	0	21	30	5	0	2
	51-61	B3	2	6	1	0	19	30	5	0	2
	61-72	B3	2	7	1	0	20	32	5	0	2
Sardis silt loam:											
S-73-AR-29-20-(1-6)	0-7	Ap	7	1	0	0	8	48	5	2	7
	7-12	B21	2	0	0	0	9	25	5	1	5
	12-26	B22	3	1	0	0	10	25	5	1	5
	26-41	B23	2	1	0	0	10	19	5	1	5
	41-56	B24	1	1	0	1	9	14	5	0	4
	56-72	C	1	0	0	0	9	14	5	0	5

See footnote at end of table.

TABLE 19.--CHEMICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable acidity	Base saturation	Reaction (1:1 soil to water)	Organic matter	Available phosphorus
	In		Meq/100 g	Meq/100 g	Meq/100 g	Meq/100 g	Meq/100 g	Pct	pH	Pct	P/m
Smithdale fine sandy loam:											
S-70-AR-29-5-1(1-7)	0-7	Ap	1	0	0	0	3	33	6	1	8
	7-13	A2	1	0	0	0	3	38	6	1	2
	13-23	B21t	2	1	0	0	6	38	6	0	2
	23-37	B22t	1	1	0	0	8	19	5	0	2
	37-52	B23t	1	1	0	0	8	14	5	0	2
	52-61	B24t	1	1	0	0	6	16	5	0	2
	61-72	B25t	1	1	0	0	7	15	5	0	2
Smithton fine sandy loam:											
S-71-AR-29-11-(1-6)	0-7	A1	1	0	0	0	4	28	5	1	5
	7-21	B1g	1	0	0	0	4	23	5	1	8
	21-35	B21tg	1	0	0	0	6	17	5	1	10
	35-49	B22tg	1	0	0	0	9	13	5	0	1
	49-61	B23tg	1	0	1	0	12	12	5	0	1
	61-72	B24tg	1	0	1	0	16	12	5	0	1
Sterlington very fine sandy loam:											
S-71-AR-29-15-(1-6)	0-7	Ap	2	1	0	0	2	52	5	1	16
	7-15	A2	2	1	0	0	1	67	6	0	21
	15-30	B21t	7	2	0	0	4	71	6	0	50
	30-45	B22tg & A'2	3	3	0	0	2	78	7	0	39
	45-59	B3	2	4	0	0	1	86	7	0	25
	59-72	C	2	2	0	0	1	83	7	0	18
Trebloc silt loam:											
S-73-AR-29-23-(1-7)	0-7	Ap	5	1	0	0	12	35	5	3	3
	7-19	B21tg	2	1	0	0	12	19	5	1	5
	19-32	B31tg	2	1	0	0	13	20	5	1	5
	32-42	B22tg	3	2	1	0	18	22	5	1	4
	42-52	B23tg	3	2	0	0	20	21	5	1	4
	52-63	B24tg	5	3	2	0	21	32	5	1	3
	63-72	B25tg	4	5	2	0	20	37	4	0	3
Tuscumbia clay:											
S-70-AR-29-4-(1-6)	0-8	Ap	27	2	0	0	10	75	6	2	13
	8-23	B21g	26	1	0	0	7	80	6	1	9
	23-33	B22g	23	1	0	0	7	79	6	1	4
	33-44	B23g	24	2	1	0	6	82	6	1	3
	44-59	B24g	24	2	1	0	4	88	7	1	4
	59-72	B25g	27	2	1	0	3	91	7	1	4
Una silty clay loam:											
S-70-AR-29-2-(1-6)	0-7	Ap	16	2	0	0	12	61	6	3	18
	7-17	B21g	16	3	0	0	12	61	6	1	19
	17-32	B22g	11	3	0	0	14	52	5	1	9
	32-44	B23g	16	4	1	0	20	51	5	1	5
	44-57	B23g	16	4	1	0	18	54	5	1	8
	57-72	B24g	16	4	1	1	15	59	5	1	7

*Calcareous.

TABLE 20.--ENGINEERING TEST DATA

[Tests performed by Arkansas State Highway Department, in cooperation with the Bureau of Public Roads, U.S. Department of Commerce, in accordance with standard procedures of the American Association of State Highway and Transportation Officials (AASHTO)(1)]

Soil name and location	Parent material	Arkansas state highway laboratory numbers	Depth from surface	Moisture density data[1]: Maximum dry density	Moisture density data[1]: Optimum moisture	Mechanical analysis[2]: Percentage passing sieve--: No. 10	No. 40	No. 200	Percentage smaller than--: 0.05 mm	0.02 mm	0.005 mm	0.002 mm	Liquid limit	Plasticity index	Classification: AASHTO[4]	Classification: Unified[5]
			In	3/	Pct								Pct			
Desha clay: NE1/4, SW1/4, SW 1/4, sec. 26, T. 7 S., R. 10 W.	Unconsolidated clayey alluvial deposits on bottom land.	S-73-AR-29 26-3	12-27	96	26	99	98	96	--	--	--	--	69	44	A-7-6	CH
		26-4	27-43	99	24	98	96	95	--	--	--	--	60	37	A-7-6	CH
		26-6	58-72	97	26	98	98	96	--	--	--	--	71	45	A-7-6	CH
Mayhew silty clay loam: NW1/4, NE1/4, SE 1/4, sec. 18, T. 12 S., R. 24 W.	Unconsolidated clayey coastal plain deposits on upland.	S-71-AR-69 22-2	6-15	88	30	100	100	96	--	--	--	--	64	37	A-7-6	CH
		22-5	36-49	94	26	100	99	93	--	--	--	--	59	37	A-7-6	CH
		22-6	49-61	108	19	99	97	87	--	--	--	--	38	23	A-6	CL
McKamie silty clay loam: NE1/4, SE1/4, NW 1/4, sec. 26, T. 13 S., R. 26 W.	Unconsolidated clayey alluvial deposits on terraces.	S-71-AR-29 13-2	4-19	96	25	100	99	96	--	--	--	--	61	32	A-7-6	CH
		13-4	29-38	102	23	100	98	97	--	--	--	--	59	32	A-7-6	CH
Sacul fine sandy loam: SE1/4, SW1/4, SW 1/4, sec. 31, T. 13 S., R. 23 W.	Unconsolidated clayey coastal plain deposits on upland.	S-70-AR-29 8-2	5-14	99	24	94	89	80	--	--	--	--	56	26	A-7-6	MH
		8-4	22-36	90	29	100	99	97	--	--	--	--	69	30	A-7-5	MH
		8-5	36-51	94	27	99	99	96	--	--	--	--	57	23	A-7-5	MH

[1]Based on AASHTO Designation: T 99--57, Method A (1).

[2]Mechanical analyses according to AASHTO Designation T 88-57 (1). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHTO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-sized fractions. The mechanical analysis data used in this table are not not suitable for naming textural classes for soils.

[3]Pounds per cubic foot.

[4]Based on AASHTO Designation M 145-66 (1).

[5]Based on ASTM Designation D 2487-66T.

TABLE 21.--CLASSIFICATION OF THE SOILS

[See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Alaga	Thermic, coated Typic Quartzipsamments
Bowie	Fine-loamy, siliceous, thermic Fragic Paleudults
Briley	Loamy, siliceous, thermic Arenic Paleudults
Demopolis	Loamy-skeletal, carbonatic, thermic, shallow Typic Udorthents
Desha	Very-fine, mixed, thermic Vertic Hapludolls
Gore	Fine, mixed, thermic Vertic Paleudalfs
Guyton	Fine-silty, siliceous, thermic Typic Glossaqualfs
Harleston	Coarse-loamy, siliceous, thermic Aquic Paleudults
Houston	Very-fine, montmorillonitic, thermic Typic Chromuderts
Kipling	Fine, montmorillonitic, thermic Vertic Hapludalfs
Kirvin	Clayey, mixed, thermic Typic Hapludults
Latanier	Clayey over loamy, mixed, thermic Vertic Hapludolls
Marietta	Fine-loamy, siliceous, thermic Fluvaquentic Eutrochrepts
Mayhew	Fine, montmorillonitic, thermic Vertic Ochraqualfs
McKamie	Fine, mixed, thermic Vertic Hapludalfs
Millwood	Very-fine, montmorillonitic, thermic Vertic Paleudalfs
Oklared	Coarse-loamy, mixed (calcareous), thermic Typic Udifluvents
Oktibbeha	Very-fine, montmorillonitic, thermic Vertic Hapludalfs
Ora	Fine-loamy, siliceous, thermic Typic Fragiudults
Ouachita	Fine-silty, siliceous, thermic Fluventic Dystrochrepts
Perry	Very-fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Portland	Very-fine, mixed, nonacid, thermic Vertic Haplaquepts
Ruston	Fine-loamy, siliceous, thermic Typic Paleudults
Sacul	Clayey, mixed, thermic Aquic Hapludults
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
Sardis	Fine-silty, siliceous, thermic Fluvaquentic Dystrochrepts
Savannah	Fine-loamy, siliceous, thermic Typic Fragiudults
Sawyer	Fine-silty, siliceous, thermic Aquic Paleudults
Smithdale	Fine-loamy, siliceous, thermic Typic Paleudults
Smithton	Coarse-loamy, siliceous, thermic Typic Paleaquults
Sterlington	Coarse-silty, mixed, thermic Typic Hapludalfs
Sumter	Fine-silty, carbonatic, thermic Rendollic Eutrochrepts
Terouge	Fine, montmorillonitic, thermic Aquic Chromuderts
Trebloc	Fine-silty, siliceous, thermic Typic Paleaquults
Tuscumbia	Fine, mixed, nonacid, thermic Vertic Haplaquepts
Una	Fine, mixed, acid, thermic Typic Haplaquepts

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